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MAY 1920.

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of all Economic Topics of Interest

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MYSORE ECONOMIC CONFERENCE.

BY THE EDITOR.

THE next session of the Mysore Economic Conference will be held at Mysore on the 1st June. This is the first session of the Conference to be held under the new organization adopted last year. This organization has been described in previous issues of the *Journal*. Put briefly, it seeks to give permanence to the Conference as an institution, and decentralizes its work in the State by making over a part of it to the District Boards. For this purpose, the necessary alterations in the laws governing these local bodies have been notified and doubtless will be pushed through the legislature in due course. These alterations in the law will not only give a statutory basis to the carrying out of Economic work in the districts but also make it obligatory on the bodies concerned to give adequate attention to it. This work should in the future attract greater attention at their hands, as the development of the areas included in the different districts is, or rather ought to be, their main concern. The position in some districts at least is such that the Economic amelioration of their people ought to be the primary concern of both the Government and the people resident in it. To aid the local bodies Government will doubtless, if found necessary, extend such help as may be required during the preliminary stages. One thing which we would like district bodies to consider carefully is how far their machinery is suited for their work. The work is fairly clearly chalked out for them and they should see what particular machinery they require for carrying it out. The old organization in the district was of one kind but since the district bodies have secured control over this work also, they should see if they want any change, and if so of what kind. This apart, they should also see how their supervisory power should be exercised. They may also consider how they should co-ordinate the work in the villages, taluks and districts in order to make the new scheme a success. This subject is of the utmost importance and we should like to see it taken up in earnest by the members of the various Districts.

The War is now happily over, though we are still in the transition stage from war to peace. The Economic conditions in the west during the past twelve months have been not of a reassuring kind. But these conditions are found to pass away before long and with it the trade boom will commence. For this, our people should prepare themselves. They should if possible prepare from now on what objects they should concentrate their attention. What, for instance, they should raise as commercial corps; what they should manu-

facture on a large scale, and what large industries they should take up. If this were done, we would soon be in a position to see what machinery we might require and make arrangements for its importation. The demand for machinery is great and orders from Japan are said to be so great that English firms are reported to be full up with them. Machinery of certain kinds can never be imported at a moment's notice. Early booking is necessary and this is not possible unless we push through our arrangements. Whether it is a Paper Factory or a Cotton Mill the suppliers will want adequate time and unless we take heed we may not be in a position to give them this. Otherwise the result will be disappointing and there will be no body to blame but ourselves.

Among the subjects that we should like to see discussed at the next Conference in a business like way is the question of the promotion of large industries in the State. Again and again this has been discussed but so far no satisfactory conclusions have been arrived at. Government cannot be expected to pioneer all industries. That being so, what special measures are necessary to enable people in the State to start large industries? The Indian Industrial Commission point out in their Report (see paras 294 to 300) the circumstances in which Government financial assistance may be given to large industrial undertakings. *Inter alia* they state (para 298) the capital required by them should be raised in India in rupees. It would be profitable to know how far we should follow this principle in our own State. This, however, is only one of the many subjects which will require attention at the next Conference. It would, as in the past year, be advantageous to concentrate attention on the more important and urgent questions—including those of policy—and discuss them fully instead of spreading out the limited time available on a larger number of subjects some of which at least might well wait for their turn in the coming years. A carefully chosen agenda would, from this point of view, be a valuable and in fixing public attention on what is urgently required by the country from a *practical* point of view. A Conference of this kind serves its purposes best when it takes a thoroughly practical interest in matters affecting the Economic advancement of the people of the

CO-OPERATION IN MADRAS, 1918-19.

By "Rusticus."

Mr. Hemingway's Report on the working of his Department for last year would be even more valuable than it is if he had not made it difficult in some places to see the wood for the trees. There are far too many statements in the body of the Report and several of them are not at all easy to follow. As our readers must be aware by this time, the figures which we regard as supplying by far the best test of the soundness of the co-operative movement in any Province are those of outstanding arrears. Mr. Hemingway furnishes figures of demand, collection and balance separately for principal including arrears, interest due in previous years and interest due in 1918-19. It would, one would have thought, have been easy to show exactly how societies stand in respect of arrears of principal and interest combined both in relation to their central banks and to their members but the reader is left to work this out for himself. The result of the sum is distinctly satisfactory especially when it is remembered that Madras, though better off than some other parts of India, by no means escaped the effects of the bad monsoon of last year and was also ravaged by influenza. Of a total demand of Rs. 139½ lakhs for all classes of societies, provincial and central banks, agricultural and non-agricultural societies, about Rs. 25¾ lakhs were still in arrears at the close of the year, a percentage of rather less than 19. Comparisons are notoriously invidious but there are two or three provinces in India where the arrears are over 50 per cent. Madras has, therefore, every reason to be congratulated. At the same time, the Local Government do well to express the hope that better results will be achieve

this year for the accumulation of arrears is one of the first signs of retrogression.

The number of societies in Madras in 1918-19 increased from 2,718 to 3,676, the number of members from 191,000 to 244.000 and the working capital from Rs. 234,92 lakhs to Rs. 305'79 lakhs. In other words or rather figures, societies inereased by 35'2 per cent, members by 28 per cent and working capital by 30 per cent. This represents a far more rapid rate of increase than has been achieved in any year since the co-operative movement was first started. That expansion has not been secured at the expense of stability in past years is shown by the fact that the registration of only ten agricuttural and two non-agricultural societies was cancelled during 1918-19. There would appear to be a few societies in Kistna and Madura which deserve liquidation but the Registrar is probably right in endeavouring to see what can be done by re-organization before proceeding to extreme measures. We could wish that other Local Governments were as ready as is the Government of Madras to realize that, encouraging as the progress of the co-operative movement has been, the work which has so far been accomplished represents little more than a few drops in the ocean. The Government of Madras point out that the number of villages affected by the societies at present in existence bears but an infinitesimal proportion to the total number of villages in the Province and that there is a vast field for expansion. Many tracts have been left almost untouched or only partially developed and this is due partly to geographical reasons and partly to lack of sufficient propagandist work. If the full benefits of co-operation are not to be confined to a favoured few, a greater effort must be made in the future and more propagandist work must be undertaken to achieve the end in view. It is obvious that this means more staff and it is satisfactory to see that the Local Government are quite ready to provide for a large increase. But however large the Government staff it will always be insufficient. It cannot be too often reiterated that the future of co-operation in India depends upon the non-official worker. Madras has, on the whole, been fortunate in this respect but, as the Government review emphasizes, there is always need for more.

As a general rule, the working of agricultural credit societies in the Provinces calls for little comment from us. It has become somewhat stereotyped and it is not often that the Registrars have any fresh light to throw on it. Mr. Hemingway's Report is a welcome exception. He has carried out an interesting census of the membership of this class of society, which we need hardly remind our readers is much the most importaut of all, and has found that of the 171,262 members at the end of the year, 23,783 were non-agriculturists and 20,226 lived partly by agriculture and partly otherwise. Of the 127,253 agriculturists, 13,022 were non-cultivating landholders, 93,267 were cnltivating land-holders, 16,853 tenants and 4,111 were field labourers.

The correctness of Mr. Hemingway's conclusion that these figures show that the societies are not serving the poorer members of the community cannot be disputed. He states that he has discussed the matter with the representatives of several hundred societies and they admit that this is the case. They urge that it is difficult and dangerous to lend money to a man with little or no tangible property. Mr. Hemingway pointed out to them—it is discouraging that it should be necessary to point out so obvious a truism at this stage—that the essence of co-operative lending is that it should be based largely on character and not wholly upon tangible security and that if societies decline to admit poorer members or to give them money, they fall far below the co-operative ideal. Mr. Hemingway says that most of the village co-operators with whom he discussed the subject expressed themselves in agreement with this view and promised to mend their ways.

If they do not, he considers that it will be necessary to organize a large number of separate societies for the poorer classes. Madras has already done quite well in this direction. There are 233 societies of all classes in which 25 members or not less than two-thirds are Panchamas, an increase of 73 on the previous year. To revert for a moment to the statistics of agricultural credit societies, classification by caste showed that 20,782 members of these societies were Brahmans, 119,485 non-Brahman Hindus, 9,431 Christians, 9,821 Muhammadans and 10,050 Panchamas. The Panchama membership increased during the year by 2,972.

A second very important feature of the working of agricultural credit societies on which Mr. Hemingway comments is the extremely small proportion of the number of loans to the number of members of societies. He thinks that the figures he gives for the loans granted by agricultural societies—in 1918-19, Rs. 66·61 lakhs in 77,579 loans—prove conclusively that societies are not finding all the money that their members can legitimately expect to borrow from them and that this is partly due to the difficulty and delay in getting money from the central banks. Mr. Hemingway's further remarks on this point deserve quotation *in extenso*. "A man cannot wait for several weeks to get money from the bank. Special arrangements are being made by many of the banks to give the societies facilities for speedy accommodation which will largely get over this difficulty. But I am afraid that it is also true that societies are afraid to lend their members the amount of money which they know their members must have, if not from them, from some one else in order to carry on their agricultural operations and maintain their families. Indeed, in some few societies it is the rule that no new loan should be given to a man until he has completely discharged his prior debts to the society. A little reflection should, however, convince any co-operator that it is as bad for the society, as it is for the member, to allow him to go outside the society for the money that he reasonably requires instead of accommodating him from the society's funds. If he takes money from the sowcar, he is exposed to loss owing to the rapacious terms of the lender. It generally results in the applicant selling his produce on the threshing floor—a source of serious loss; and if he is exposed to this loss, he is obviously not in so good a position to pay his debts to the society as he would have been if he had borrowed his extra money from the society at reasonable terms. I trust our societies will succeed better in future in meeting the reasonable requirements of their members."

Madras is still much behind Bombay in regard to agricultural societies for purchase, purchase and sale and production but substantial progress was recorded last year. Particularly interesting are the societies which were formed at Tindivanam and in South Kanara. The Tindivanam society is a combination of society and individual members and its primary object is to prepare the raw produce of its members for market. It has purchased two cotton gins and a 36 horse power oil engine and proposes also to purchase two decorticators for groundnut and a disintegrator for the manufacture of bone meal. It has also obtained the loan of three hand cotton presses from the Agricultural Department. It has a substantial share capital and is regarded by the Registrar as a most promising venture. The South Kanara Garden Planters' society operates over an area rather larger than a taluk and its members consist of growers of areca and other garden produce. Its main business is the sale of this produce through its agents in Mangalore. Although it was only started last year, it had a turnover of nearly Rs. 4 lakhs and obtained prices higher by nearly Rs. 20,000 than would have been secured through the ordinary channels. Nearly 20 credit societies added joint purchase of their

members' requirements to their ordinary business. In addition to the purchase of Burma rice and other food, a measure stimulated by the scarcity of food prevailing in many districts, societies bought salt, kerosene oil, fish guano, seed grains of various kinds and cotton seed. The amount of the trade done was over Rs. 3 lakhs and the profits over Rs. 60,000 which shows what may be gained by the elimination of the middleman. Joint sale of produce did not make such a rapid advance. Sales amounted to Rs. 50,343 and profits to Rs. 2,415 only. As Mr. Hemingway points out, the smallness of the profits is evidence that much has still to be learnt about this branch of trade.

Non-agricultural societies, both credit and non-credit, increased greatly in numbers. As to their working, it is only necessary to remark that the results of the year, so far as weaving societies were concerned, confirm the conviction which has more than once been expressed in these columns that the Co-operative Department is engaged in a hopeless task in attempting to assist the weaving industry. In a good year, from the point of view of the cloth trade, the ordinary cloth merchants offer more attractive terms to the weavers than does their society. In a bad year, co-operation degenerates into philanthropy. Our own view is that the sooner it is recognized that the handloom industry has no future before it, the better it will be for all concerned.

In Madras, the union for supervision only is preferred to the guaranteeing union. There are now 102 local supervising unions, to which all but 410 agricultural societies are affiliated. Every district in the Presidency, with the exception of Bellary, Ramnad which is served by the Madura Bank and the Nilgiris which depends upon the Coimbatore Bank, has a central bank of its own. The efforts which are being made to reconstitute the Provincial Bank into a genuine federation are making very slow progress and it is now several years since this project was first mooted.

Mr. Hemingway mentions that the relations between the Co-operative Department and the Industrial and Agricultural Department were most cordial. It is vital to the development of all three Departments that the connexion between them should be as close as possible.

ENGLISH SYSTEM OF LOCAL SELF-GOVERNMENT. *

By the Hon'ble Mr. Surendranath Banerjea.

I have signed the collective report of my colleagues. By the terms of our reference each member of the committee is required 'to advise his own local Government as to the desirability of adopting any feature of the English system in provincial legislation.' This note is intended to meet this particular point in the reference. It applies to Bengal though I think in view of the close relationship between the different systems of local self-government throughout India, all deriving their basal principles from Lord Ripon's Resolutions of 1881 and 1882, my observations will have a general and more extended application, subject, of course, to varying local conditions.

Local Govt. Board for Bengal.

My first suggestion is the creation of a local Government Board for Bengal, and I see no reason why a similar institution should not be established in all the provinces where the conditions are not dissimilar. With the introduction of responsible Government the institution of local Self-Government will enter upon a new phase. The Montagu-Chelmsford scheme recommends (paragraph 188) that there should be as far as possible complete popular control in local bodies and the largest independence for them of outside control. This two-fold object would be secured by making the local bodies wholly elective in their personnel and constitution as under the English system, by relieving them largely of the restrictions to which they are subjected in regard to the details of administration which indeed has been done in a considerable measure in Bengal, and by placing them under the supervision and control of a Local

* Report submitted to the Government of India

Government Board as in England. The English system of having alderman on Municipal Boards may be considered and perhaps tried. This will help to do away with the system of Government nominations and yet secure the services of persons of distinction who may not care to contest elections and of men belonging to small minorities who may have no chance of success in open elections. The proposal for the creation of a local Government Board has been under the consideration of the Government ever since the inception of the institution of local self-government. It was considered for Bengal in 1882 and was negatived by the Secretary of State. Lord Morley referred to it in his despatch of the 27th November, 1908, observing that it should be considered' how far in each province it would be desirable to create a department dealing exclusively with these local bodies guiding and instructing them, correcting abuses in a form analogous to the operations of the local Government Boards in this country.' The question came up for consideration before the Decertraliza-tion Commission in 1909 and was rejected by them though the late Mr. R. C. Dutt, the only Indian member of the Commission was in favour of it. Indian opinion whenever it has an opportunity of expressing itself supported the idea of a local Government Board. A resolution was moved in the Imperial Legislative Council in 1914 recommending the creation of local Government Boards. It was largely supported by the non-official Indian members, but the Government did not see their way to accept the recommendation. The views ot the Government of India, however, like those of all progressive Governments have now undergone a change; and in their resolution dated the 16th May 1918, they 'suggest for the consideration of the Provincial Governments the constitution of a central body which should co-ordinate the experience of the local bodies and provide improved control and guidance by entertaining further inspecting establishments if necessary.' The resolution goes on to add: 'Such a central body should be in direct touch with the Government and might fitly be presided over by a member of the Executive Council. It should further be considered whether in place of a formal Board there might not be Standing Committee for local and municipal affairs in direct contact with the Government to be largely drawn from elected members of the Legislative Council.

ABSENCE OF CONTINUITY OF POLICY.

The Government of India recognise the need of co-ordinating the work of the local bodies. 'In Bengal, and I presume, it is the case in other parts of India, the local bodies are supervised by the magistrate of the district and the Commissioner of the division where there is one. The result is that the degree and the quality of the supervision differ in different places. There is no guarantee of the continuity of a definite policy or of the steady growth of sanitary and other improvements. I have been informed of works of Sanitary improvement started by one magistrate which were suspended by his successor on his transfer to another district. If there was a central supervising authority such contingency would be impossible. Under existing conditions the efforts of local bodies are often dissipated. Acting in their individual spheres and as isolated units without a central co-ordinating authority they often lack method, initiative, expert knowledge and organized effort which at times as in the case of drainage and water works must extend beyond their immediate local jurisdictions. Local Governments in the conditions which are now about to be established in India must play an increasingly important part in the administration of the country. It will deal with sanitation which in the Bengal is the most vital problem and also very largerly with the sphere of Education. Expert knowledge and guidance will be needed. Obviously the district officers, and I mean no reflection upon them, are not as a rule experts in these matters; and if even they

were, the demand upon their time and attention are so multifarious in connection with the general administration of their districts that it would be impossible for them to do justice to them. The Government of India indeed express the view in the resolution to which I have referred that 'the powers of collectors and commissioners should be maintained,' in connection with local affairs. I submit that if there is to be a central authority the interposition of intermediary authorities would not only be unnecessary but would complicate the working of the machinery and cause avoidable delay. It should be open to the central authority to invoke the assistance of the collectors and the commissioners for information and report but neither the district officer nor the Commissioner of the division should have a recognized or statutory place in the new machinery of local Government.

It will be seen from the extract which I have quoted that the Government of India suggest for the consideration of the local Government the formation of a local Government board. It should, in the opinion of the Government, 'be a formal board or a standing committee for local and municipal affairs in direct contact with the Government and to be largely drawn from elected members of the Legislative Council.' The views of the Secretary of State are somewhat different, though both these high authorities are agreed that there should be a local Government Board for instruction and guidance. The Secretary of State say in his despatch of the 29th November 1918:—

'Such powers as are possessed and in practice frequently exercised by the local Government Board in England seem to be necessary part of a well administered system of self-government in local areas and I do not consider that the place of such a permanent department can effectively be taken by a Standing Committee of the Legislature. A body such as you contemplate would, I doubt not, prove very helpful to the local Government and would be analogous to the advisory committee that are often established in this country by the Ministers of departments for the purpose of reference and consultation. That such committees cannot exercise the continuous control and guidance that is required and are merely auxilliary to the permanent establishment of trained officials and experts who form the department and who discharge the duties of supervision and control which by law or statutory rules are assigned to the central authority. The expert inspecting establishment which you suggest might eventually be entertained by the standing committee, would according to the English practice form a permanent department under the Minister, and would report to him and act under his instructions. It would be for him to decide the cases in which and the manner in which he would take the advice of the Standing Committee. I make these remarks because the English practice is the outcome of long experience and in my opinion maintains a necessary distinction between the duties of the permanent executive staff, the individual responsibility of the Minister and the functions of an advisory committee.

RESPONSIBILITY OF THE MINISTER.

The principles laid down in the concluding passage of the despatch I have noted, will, I venture to think, commend themselves to Indian public opinion. There should be the undivided responsibility of the Minister, and no institution should be created calculated in any way to minimize or to reduce it; and it is equally clear that he should be aided by an inspecting and supervising staff who would be subordinate to him but whose responsibility to him in their own spheres must be equally clear and well-defined. In this connection I may perhaps add that it would be expedient to provincialize municipal and district board service in its higher branches above a certain pay. In England, the local Government Board means the Minister, and

he is not assisted by a Board on Standing Committee, unless he chooses to call one to his aid for any special purpose. As the experiment of a popular minister controlling a great department would be altogether new and it is possible that he may not have personal experience of the working of local boards, I would recommend the formation of a Standing Committee purely advisory in its scope and functions to assist him, the Committee consisting of not more than three or four members to be selected by the Minister himself from among the selected members of the Legislative Council. Such a body, if properly chosen, would place him (and he would have the strongest motive to make a wise selection) in possession of first hand knowledge and experience and at the same time his responsibility would remain unaffected as he would be under no obligation to follow their advice. The committee may be further strengthened by two additional members, one representing the Municipalities and the other the district boards of the Province chosen by them. The initiative would remain with the minister, his sense of responsibility would be unimpared; his schemes of improvement would be bold yet tempered with caution, the result of helpful and well-informed advice, and yet he would be firm in their execution. After a time such an advisory committee may not be needed, but it seems to me to be a desirable safeguard at the start. The existence of such a committee need not interfere with his calling to his aid such other expert advice as he may think necessary.

THE ENGLISH SYSTEM.

The local Government Board in England is vested with large powers of control and supervision. But it is not to be understood that it is autocratic in the exercise of its power. Persuasion rather than compulsion is the chief weapon in its armoury, and persuasion having behind it substantial authority which may at any moment be called into operation is usually found to be effective. Public opinion plays a prominent part in the working of the entire machinery of local self-Government in England, and I feel that with the transfer of the departments to popular control, with a minister responsible to the Legislature and with a sense of growing power in the electorate, popular opinion will within a reasonable distance of time become a powerful and inspiring factor in determining the administration of our system of local self-government. I have no fears as to the autocracy for a local Government Board. For, the board will mean the popular minister responsible to the Legislature and amenable to its control and in the last resort to that of the electorate.

The efficiency of an administration, local or provincial, largely depends upon its funds and much of the usefulness of local bodies and of their capacity to cope with their legitimate work will be determined by the measure of their financial resources. Lord Morley in his despatch of the 27th November 1908, to which I have already referred says, in regard to this aspect of the question, that funds have not existed for an efficient executive staff. The friends of local Self-Government in India from Mr. Gokhale downwards have all deplored the inadequacy of the resources available to the local bodies. In England the local bodies possess unrestricted powers of taxation of which considerable use is made. But it is idle to think of local bodies in India emulating the local authorities in England in this respect. With our growing wants and with the pressure of public opinion to meet them the rate of local taxation will rise; but even then a large margin of local wants will have to be supplied from resources other than local. In England substantial grants are made by the State to local authorities for what are called semi-national services such as primary education, tuberculosis, child-welfare, housing, etc. Here is an extract from an Essay by Captain C. M. Lloyd on constitutional problems which

appears in the local Government Series No. 1, page 40:—

'But modern economic changes and the development of public opinion have led in the last few years to a rapid growth of the grants-in-aid, especially on the national or 'semi-national' services. By the year 1916, the total subventions from the national exchequer to the local authorities in England and Wales (which in 1870, was under £2,000,000, and in 1900 about £10,000,000) amounted to £23,160,815. And the sum, of course, has continued and will continue to arise with the recent extension of the principle in the sphere of public health, *e.g.*, grants-in-aid of clinics, maternity services, treatment of tuberculosis and venereal disease and the large subsidies promised in respect of housing in the near future. The bulk of these subventions, it is important to notice, do not pass through the local Taxation Account but are 'monies voted annually by Parliament,' and these represent a reaction against the Goschen System, and a return to the old plea of direct grants. Of the £23,160,815 mentioned above only about eight and a half millions come from the local Taxation Account, and the proportion of the direct grants is steadily increasing.'

Parliamentary Grants to Local Boards.

The above demonstrates the growing tendency of parliament to make grants to the local bodies out of State funds in aid of sound national services. The volume of these grants has steadily grown from year to year. Water-works, drainage, primary education, anti-malarial measures, and such as may be adopted for the prevention and eradication of cholera and plague and others which might be named should be regarded as semi-national service in the English sense. I strongly recommend that the Government should follow the English example in this respect and assist the local bodies with their subsidies. Something has been done in this respect by making over to local bodies the proceeds of the Public Works Cess, but the policy is one that in view of our growing local wants is capable of considerable expansion. In the Provincial Budget a fixed allotment should be provided for subsidies to local bodies and also provision should be made for loans to be advanced to them.

Control of Primary and Secondary Education.

There is only another matter to which I desire to refer in this Report. In England primary and even secondary education are controlled by the local authorities subject to the supervision and control of an Education Board, presided over by a Minister responsible to Parliament. The local authorities may appoint the teachers, lay down the curricula and generally control the administration of details but they must follow the policy and the programme laid down by the Board. In Bengal primary and in some cases even secondary schools are maintained by grants made from the local funds; but the local bodies have little or no control over them. They are managed by school committees controlled by the Government Department. This is in violation of the elementary principle that where there is financial contribution it must be accompanied by administrative control. But what is more important from the practical point of view is that the control of the local bodies conversant with local conditions and inspired by local patriotism would add to the efficiency of these schools and in the end promote the general interest of education. This is the case in England as I have been told by high authority and there is no reason why the same result should not follow in India from the operation of similar conditions. Next to religion, education is our most sacred concern; and nothing would afford a more powerful impetus to the development of local public spirit than this new sphere of public duty; and the awakened public life of the

locality would re-act upon the entire range of local concerns and exercise a bracing influènce over them all. Increased expenditure would be cheerfully acquiesced in and local resources would gladly respond to the new local demand. Increased power would foster responsibility and stimulate the spirit of sacrifice to meet it. English rate-payers are wealthy, but the readiness and spontaneity of their local efforts have their roots in the consciousness of the possession of power and responsibility. I recommend the adoption of the English system, subject to variations dependent upon differences in local conditions. The recommendation of the Calcutta University Commission for the creation of a Board to control secondary education need not interfere with the suggestion which I have made. The Board will be in the position of the Education Board in England, and subject to the general control which it may exercise and the policy which it may lay down, the details of administration in connection with the secondary schools may be left to the local bodies. If indeed it should be deemed inexpedient to start a new experiment in secondary education such as is recommended by the University Commission with a large measure of power vested in local bodies unused to educational problems of this character and magnitude, the school classes below the high schools may be made over to the control of the local bodies.

Extension of the System to Other Provinces.

I consider it desirable to adopt the above features in the system of local self-Government in Bengal and as I was the only Indian member of the committee I may perhaps be permitted to suggest that their applicability to the other Provinces of India should also be considered.

PROGRESS OF AGRICULTURAL LEGISLATION.

By the Editor.

THE Institute of International Agriculture in its *Annual* for 1918, which has just come into our hands, has as usual an interesting review of Agricultural Legislation undertaken in the countries affiliated to the Institute in the world. The text of the various laws and orders passed is published in French, while a brief introduction in English draws attention to their more important features. It is to some of these that we propose to draw the attention of our readers. As in the past year, we will only touch on those aspects of foreign agricultural ligislation as are likely to interest local readers. First as regards agricultural and trading statistics, a law of the Dominion of Canada, of May 24, 1918, orders the constitution and regulates the organization of the Federal Statistical Bureau. The function of this bureau is to compile and publish statistics referring to the commercial, industrial and agricultural activities and to the conditions of the population of the Dominion. It has the duty, among others, of taking every ten years from 1921 onwards a census of the population and of agriculture. The Bureau must draw up and publish monthly and annual statistical notes as to Canada's home and foreign trade. Decree No. 4634, of July 1918, approves the regulation, for the agricultural statistical departments of Portugal. It is the object of these departments to collect, elaborate and publish data as to the conditions and the development of agricultural and live-stock production and as to the distribution and consumption of the products of agriculture and stock farming under the head of trade in agricultural produce, machinery, etc., we would note a law of the Federation of Australia, of July 26, 1917, provides for the

keeping of corn in elevators. It also orders the appointment of a commission whose task it is to define the several types of elevators, the places in which they are to be built and the tariff of fees for depositing the corn. A Portugese decree of July 13, 1918, No. 4637, having reference to municipal granaries, rules that these must ensure the country's supply of articles of prime necessity by seconding the Government in purchasing and distributing grain and all the other articles which are, in the opinion of Municipal Councils, important factors for the food-supply of the population. The decree determines the organization and regulates the working of these granaries. A Swiss decree of June 24, 1918, regulates the trade in food substitutes, ruling that they may not be offered for sale without Government authority. A law of British Columbia (Canada) of March 15, 1918, regards the seed trade. It authorizes the Minister of Agriculture to buy seed for distribution to landowners and farmers. To obtain this seed, the farmer or landowner must sign an undertaking to return its equivalent, and this will give the Minister a claim on the grain he grows. A Brazilian decree, of March 6, 1918, grants premiums in the shape of agricultural machinery to farmers and agricultural Syndicates or Co-operative Societies who sowed wheat in the 1918-19 season. The condition essential to obtaining these premiums is that the harvest is not less than 15 hecto litres of wheat per hectare, and that the ripe grain be of a density of not less than 780 grammes per litre. A law of *Nova Scotia* (Canada) of May 9, 1917, grants credit for the making and working of agricultural machinery and implements. Another law of this country, of same date, authorizes the Governor to make grants to municipalities, agricultural societies, or individuals to facilitate their purchase of agricultural machinery. An Italian decree of July 14, 1918, authorizes the Minister of Agriculture to grant tractors and agricultural machinery generally, on receiving payment from farmers or groups of farmers. Another Italian decree, of February 24, 1918, reserves to the State the power for working directly certain deposits of lignite, mines and quarries specified in the decree, after having expropriated, if necessary, private holders of rights in these.

Coming to financial laws a law of Saskatchewan (Canada), of December 15, 1917, places a tax of one per cent of taxable value on uncultivated land. A Japanese law exempts from payments of the land tax uncultivated land which has been cleared up for cultivation, or on which other works have been executed. A decree of Costa Rica, of December 29, 1917, fixes the tax on money-lender's income at 7 per cent of gross profits. A law of Japan, of March 22, 1918, institutes a tax on War profits, namely 20 per cent of total profits in the case of companies and 15 per cent in the case of individuals. War profits are, according to this law, the difference between average income in time of peace and income in time of war. A decree of the Republic of Honduras, of February 16, 1918, authorizes for a period of five years the importing of argricultural machinery, duty free.

In Connection with vegetable production, we would note first a Belgium decree, of January 25, 1918, which regulates agricultural production by determining the proportion in which the land of farms should be used for growing wheat, potatoes, forage, vegetables, and industrial crops. A Swiss decree of January 15, 1918, concerns provisions for ensuring the development of the production of foodstuffs. With this object it directs that in each canton a cantonal office be instituted for the intensification of agricultural production, and that its mission be the encouragement of every kind of production of foodstuffs, the execution and application of provisions made by the higher authorities, and the supervision of the work of communes, corporations and individuals in the matter of the intensifying agricultural production.

The communces will, in their turn, set up communal offices for the increase of agricultural production, and these will be charged to direct and supervise the execution of the provisions of the federal and cantonal bodies. A decree of the Dutch Indies, of November 27, 1918, contains provisions intended to regulate the growing of sugar-cane. A decree of Brazil, of March 6, 1918, makes provisions aimed at extending forestry. Loans will, with this object, be made to growers who increase the number of square-feet planted with eucalyptus trees and other trees of recognized usefulness. The Government is also empowered to make free grants of land to persons engaging to plant forest trees. A decree of Chile, of May, 6, 1918, makes rules for the sale of saplings from the State forests. A law of Spain, of July 24, 1918, aims at the preservation and development of the country's forest wealth. With this object the law forbids or restricts, as the case may be, the felling of certain kinds of trees, provides against the deseases of forest trees, and sets up in each provincial Capital a Committee for the preservation of forest wealth. A law of California (U.S.A.,) of May 24, 1917, enacts measures for the encouragement of the development of fresh fruit production in California. The law also standardizes methods of packing certain kinds of fruit. A Spanish law, of July 24, 1918, orders that all mining concessions granted or to be granted in the future both for potassic salts and for other mineral substances which can be used as chemical manures, must be under State control, as regards both the extraction of the substances and their sale.

Under the head of animal production, we would note first a decree of Brazil, of February 27, 1918, which ensures the protection and encourages the breeding of sheep and goats, especially in that it grants premiums for the importing of animals for breeding purposes. A law of Alberta, of April 5, 1917, aims at encouraging the breeding of live-stock by making loans for the purchase of blood animals to breeding associations. A decree of Japan, of April 20, 1918, aims at the improvement of flocks. It authorizes the Superintendents of Stations of highly bred sheep to lend rams to traders who apply for them and to breeder's associations and Co-operative Societies, on condition the borrowers dispose of at least five highly bred ewes. A decree of Brazil, of June 5, 1918, forbids (for the duration of the War) the slaughter on any territory of the Republic of cows less than eight years old and suitable for breeding. An Italian decree of July 7, 1918, prohibits similarly the slaughter of horses, asses and mules fit for breeding purposes, and makes rules for the slaughter of fat stock of these species. A French decree of September 20, 1918, sets up an interministerial silk committee, directed to evoke and co-ordinate action for ensuing the French supply of silk-cocoons and of raw and worked silk. An Italian decree, of May 9, 1918, makes rules for the production of and trade in silk-cocoons. A Japanese decree, of May 17, 1918, has the object of encouraging development of silkworm rearing. It grants premiums to growers of mulberry trees and producers of silk-cocoons. Another Japanese decree, of June 17, 1918, provides for fighting silkworm disease. Under legislation dealing with agricultural orgaization and agricultural education, may be first noted a law of Queensland (Australia), of November 23, 1918, which authorizes the institution and working of State industrial enterprise, subject to the control of a State commercial office. The enterprise is to include breeding stations, sawmills, coal mines, etc. An Italian decree, of May 12, 1918, sets up at Rome a Higher Committee of State Mechanical Cultivation and a depository for the apparatus and school of mechanical cultivation. Another Italian decree, of November 21, 1918, founds a committee of trading information at the Ministry of Industry, Trade and Labour. A French decree, of November 30, 1918, constitutes within the

Ministry of Agriculture a higher Agricultural Implements Committee which is directed to examine and propose measures calculated to ensure the development of the manufacture of agricultural machines and implements and to make known the methods of using them. Another French decree, of January 23, 1918, constitutes within the Academy of Sciences a department commissioned to study the application of Science to industry. A Portuguese decree, of September 14, 1918, makes rules for the organization of itinerant agricultural lectureships, the instruction given to be essentially practical aud to take the form of lectures and demonstrations by agricultural experts in rural centres which will serve to spread among the farmers of the different districts a knowledge of the scientific principles on which agricultural processes and technique and breeding should be based.

Under diseases of plants, pests, etc., we would note a Dutch law, of June 1, 1918, which aims at protecting potatoes against diseases to which they are liable. It rules that imported potatoes may not enter the country except through certain specially named customs offices which are able to ensure their healthy condition.

Under agricultural co-operation, insurance and thrift, we would first note a French decree, of February 22, 1918, which institutes within the ministry of Labour and Social Thrift a Committee called the Higher Council of Co-operation and directed to study all questions relevant to the development of the Co-operative movement. A Portuguese decree, of July 9, 1918, makes rules for the constitution and working of joint-stock companies as regards their administration and their purchase of real estate. A law of Guatemala, of April 12, 1918, founds a national bank which will, among other things, encourage agricultural credit. A decree of the Korean Government, of June 7, 1918, institutes the Bank for the Economic Development of Korea. The bank, which has a capital of 10,000,000 yens, proposes to make amortizable loans secured by mortgages on real estate, loans secured by fishing rights, loans without real security to groups of collectively liable farmers, loans to Co-operative Societies, local currency associations, etc., loans secured by pledged crops, etc. The law authorizes this bank to issue debentures for an amount proportionate to the paid-up capital and to the total sums of the loans made. Methods of controlling the bank in order to ensure the working of its departments, are fixed by the law. A Portuguese decree of July 6, 1918, establishes a system of industrial warehouses authorized to receive certain kinds of produce on deposits, to issue certificates of deposits and securities, to sell deposited merchandise, and to encourage trading relations between Portuguese and foreign producers and traders.

Under the head of rural property and land settlement we would note only a few laws about consideration of holdings. A French law of November 27, 1918, aims at facilitating the consolidation of rural holdings. When on land which may belong to one or more commnues, properties not built upon are divided and scattered, consolidation may be undertaken, the parcels being distributed anew so that the farming of the properties to which they belong is improved. Exchanges arising out of a consolidation are made in kind and aim at giving to each landowner a piece of land proportionately equal, as regards extent and quality, to the land he previously held within the area on which the consolidation takes place. The law also prescribes formalities which must be gone through when consolidation is effected, and specifies the legal consequences of consolidation, not omitting those bearing on the charges on the land. A Swiss decree of March 23, 1918, provides that the federal Government may make grants to enable the enterprise of consolidated properties held in parcels, and states what are the formalities this entails. Among other measures relating

to rural property is a French law of November 6, 1918, which amends the law of May 3, 1841, as to expropriation in the public interest. It introduces two innovations into the legislation hitherto in force, expropriation of districts and taxation of a proportion of added value. As regards the former point, the law broadens the conception of public interests as implying a right to expropriation, applying it to lands outside the scope of public works but necessary to ensuring the full usefulness of these and the complete realization of their value. As regards the second point, it prescribes that landowners benefiting by the expropriation must pay a proportion of the increment of value accruing to the real estate.

Finally, under the head of rural hygiene and the protection of crops, plantations and stock, we would note a Brazilian decree of August 16, 1918, which aims at providing a rural prophylactic department of which the essential task will be the fighting of all diseases, whether epidemic or endemic, which are propagated in the country. A decree of Morocco of September 4, 1918, contains provisions for preventing forest fires. From 1st July to 1st October, all lwellings—houses and other buildings in or iear forests must be surrounded by wide renches, so that if a fire occur it may not pread. A Spanish law of June 20, 1918, ims at preventing the free pasturing of bulls nd stallions in common lands belonging to ocieties of rural economy.

The suggestiveness of several of the laws id decrees above referred to is self-evident. hey hardly need any comment or criticism our hands to secure for them the attentive nsideration they deserve in this country.

JAPANESE TRADE IN INDIA.*

The most remarkable and significant feature of India's import trade during the war has been the prodigious expansion in imports from Japan. The imports have almost doubled in value each year since 1914-15, and the total value during the year 1918-19 was almost eight times that of 1914-15.

Japan now occupies the second place in India's import and export trade. Her shipments to India in 1918-19 amounted to over 22,000,000*l.*, as compared with 51,000,000*l.*, from the United Kingdom during the same period. In 1913-14 the corresponding values were 3,000,000*l.*, and 78,000,000*l.* The leading imports, in order of importance, comprise cotton yarn and piecegoods, 47 per cent; silk manufactures, 6 per cent; matches, 4 per cent; iron and steel, hardware, cotton hosiery, brass, bronze, etc.; chemicals; paper; instruments and appliance; tea chests; plants; beer; apparel; woollen manufactures; glassware; machinery; cement; earthenware; haberdashery; manufactures of wood; toys; stationery; toilet requisites, etc., etc.

Before the war, the share of Japan in the import and export trade of India was only 2½ per cent and 7½ per cent respectively, and her manufactures did not come into direct competition with United Kingdom goods. In fact, owing to her heavy purchases of Indian cotton, amounting in value, in 1913-14, to nearly 13,000,000*l.*, there was a very heavy balance of trade against the country, and this was regulated through London. Japanese manufacturers, during the period between the Russo-Japanese War in 1904-5 and the outbreak of hostilities, were mainly engaged in extending their markets in Korea, Manchuria and China, and did not, as a rule, look further afield. The war, however, gave them an

* Appendix to the Report of the Committee on Imperial Preference. The Report itself is published

exceptional opportunity, and they immediately proceeded to extend their connections in India, the Straits Settlements and Dutch East Indies; and later on in the British Dominions, the United States and Europe. The principal Japanese overseas banks, such as the Yokohama Specie Bank, the Bank of Taiwan, and the Sumitomo Bank, opened branches in Calcutta and Bombay. Direct lines of steamers were inaugurated between Japan, India and all parts of the world. Japanese shipping companies established themselves at the Indian ports, and prominent export and import houses, such as the Mitsui Bussan Kaisha and the Japan Cotton Trading Company, opened branches in Calcutta and Bombay and were followed by a number of smaller firms. Numerous commercial missions were despatched to India; but for the most part, they worked privately, and were not accredited to the Government of India. Commercial travellers and inquiry agents came over in large numbers, and are still active throughout India studying bazaar requirements and the productions of competitors, and arranging to match well-known United Kingdom qualities. Meanwhile, every importing merchant in India is flooded with price lists, catalogues, market reports, and offers from exporters in Kobe, Osaka, Yokohama and Tokio. Japanese retail stores are now noticeable in every fair-sized town in India, and individual Japanese are to be found in the most remote parts of India. The extension of Japanese activity may be measured to some extent by the fact that the last Census returns show that *in 1911 there were only 32 male Japanese in the country. Their number to-day must considerably exceed* 2,000. There is no properly accredited official commercial agent or attache in India and the Japanese consulates are supposed to attend to all official commercial work.

Not only are Japanese goods entering the country in large quantities, but Japanese merchant houses are taking up a prominent position as general distributors of imports from all over the world, and as shippers of Indian produce. For instance, during the past two years, two Japanese firms have headed the list of importers of cotton piecegoods into Calcutta; and, although the bulk of these goods were made in Japan, the imports from Manchester of one of the firms have been on a considerable scale. In exports, also, Japanese merchants are invading the trade in each article and are shipping Indian produce al over the world. In fact, during recent months, one firm has been among the first five leading shippers, and four others are shipping large quantities of hessian cloth and gunny bags, Calcutta's staple trade. In the industrial sphere, Japan has been active. Ginning and pressing plants have been acquired in the cotton districts. Efforts have been made to secure jute mills on the Hooghly, but so far without success. There is ample evidence to show that Japan is very much alive to the prospects of industrial expansion in the country.

Before the war, Japanese shipping activities were mainly restricted to the carriage of goods between India and Japan, together with such subsidiary services—*e.g.*, with the Straits and China and between Calcutta and Rangoon—as could conveniently be worked in support of the main traffic. High freights and the shortage of other tonnage, particularly during the last two years, have given to Japan, perhaps, the most lucrative of all the opportunities that the war has brought her. The following are some of the more important regular sailings from India and Ceylon that have been established since the war:—(*a*) By the Nippon Yusen Kaisha: From Calcutta to New York, Boston and Philadelphia, to the Cape, to Seattle, to Java, and from Colombo to Boston and New York. (*b*) By the Osaka Shosen Kaisha: From Calcutta to Java, and (with transhipment at Singapore) to the Cape and South America. From Colombo to Japan and Bombay, and from Bombay to Marseilles and Genoa. (*c*) By

the Yamashita Kisen Kaisha: From Colombo to the Pacific Coast.

Numerous efforts have also been made to obtain a footing in the trade between India and ports in the Persian Gulf, but these so far have not been successful. In addition to these regular services, numerous Japanese vessels have been employed on time charters in Indian waters.

It will be observed that with the exception of the Osaka Shosen Kaisha line between Bombay, Genoa and Marseilles (which was only established in the summer of 1918, at a time when the Suez Canal ports were so blocked with transhipment cargo, dumped there by Japanese vessels which refused to enter the Mediterranean, that it was a question of running the vessels right through or relinquishing all attempts to obtain a hold on the trade with Continental ports), none of the new Japanese services mentioned has involved the running of vessels in a danger area. Japan has, therefore, been able to preserve her fleet intact and extend her shipping services in waters free from submarines, and this at a time when every available vessel was required by the Allies in Europe to maintain their supplies.

One of the most remarkable features of Japanese organization is the way in which all their branches of activity abroad pull together as one unit for the furtherance of the national cause and, by means of preferential treatment to their own people *vis-a-vis* foreign competitors, contrive to place business in the hands of each other and keep out competing interests. In this connection I would instance the connections between Japanese bank and merchants, the co-operation of the Japanese shipping companies with their merchant shippers, and the measures taken by the Imperial Japanese Government to stimulate every branch and to further their industrial and commercial interests overseas. In a word, the foreign policy of Japan is primarily a forward and active commercial policy. This cohesion and co-operation of all interest the general welfare is carried to a deg which is not experienced in the case of a other nation. Even commercial Germa before the war does not appear to have be so closely knit as Japan is at the prese time. Where such patriotic combination interests is carried out openly and frankly is a most legitimate and laudable form activity and might, with advantage, be fo lowed by many British firms and institution There is always a danger, however, that suc institutions as banks and shipping companie may be tempted to use their fiduciary positio for the advantage of their own people and a the expense of other interests. Similarly, the quite legitimate desire to further the business of one's own compatriots very easily develops into a system whereby unfair preference is given to the detriment of other foreign firms.

Japanese competition may be summarized under two heads:—(*a*) the competition of Japanese manufactured goods with the products of our own industries; and (*b*) the competition of Japanese merchants with corresponding British houses in India in the distribution of imported goods and in the export trade in Indian produce and manufactures.

(*a*) Japanese manufacturers have had an opportunity for expansion during the war which is without parallel in industrial history. Although they enjoyed all the privileges of an Ally, they have not suffered any of the handicaps and difficulties which have been experienced by the Allies in Europe. On the contrary, owing to the difficulty of securing supplies from the United Kingdom and other European countries, the whole of the markets to the East were open to Japanese products. Competition was largely eliminated in many articles and, so far as India was concerned, Japanese imports of cotton textiles, metals, machinery and engineering supplies were encouraged in order to meet the great shortage. Although Japanese shipments have

increased in value nearly eightfold, and although Japanese goods are now to be found in every bazaar in the country, *the general impression is that Japan has not made the mosi of an unique opportunity.* Complaints are heard on all sides that although the first shipments against orders are usually a fair tender, succeeding shipments are below the quality of the basis sample. Importers also state that they have had endless trouble owing to late shipments, failure to comply with packing, marking or shipping instructions, mistakes in drafts and documents, late arrival of documents, failure to answer business letters, failure on the part of travellers to keep appointments and, generally speaking, most unbusinesslike methods. As a result of these methods and practices Japanese traders and their wares have earned a rather unenviable reputation in the market. During the war, owing to the great scarcity of goods and the consequent high profits made by importers, questions of quality and method of trading were not so important, and merchants merely grumbled and accepted the goods *faute de mieux.* When normal conditions recur, however, and supplies can be received from elsewhere, these defects are likely to have a most detrimental effect on Japanese trade. I am of opinion that the figures for the year 1918 indicate the high-water mark of Japanese imports into the country for some time, and that during the next few years there will be a considerable decline in the trade.

Japanese imports into the country have very largely consisted of cheap showy articles for the bazaar trade which have replaced German and Austrian goods of similar type. These articles have not, as a rule, competed with British goods, as, even prior to the war, our makers declined to put their works on goods of this nature when they were able to keep their labour well employed on the finer and more lucrative productions. So far as can be ascertained at present, Japan will probably retain this trade after the war, as—owing to heavy taxation and labour troubles—the cost of production in the Central countries is bound to increase and the articles in question are peculiarly suited to Japanese conditions of industry. These remarks also apply in the case of matches and silk products. Japanese minerals, such as copper, sulphur and brass, will probably continue to be imported in fair quantities, although Australian supplies should prove to be competitive. There is bound to be a considerable decline, however, in such articles as electric cables, wire and accessories; paper, hardware, iron and steel, machinery, cutlery, paints, apparel and haberdashery, beer, tea chests, cement and chemicals. It is to be anticipated that there will be greater competition than was apparent in 1913, but the imports during the past few years have been inflated solely on account of the shutting-off of normal supplies and not on the grounds of better quality or more economical production in Japan; so that British makers, provided their prices are not exorbitant, should regain their position in these trades. One point should be mentioned with regard to the imports from Japan of iron and steel, machinery and hardware during the early years of war. In many cases the goods were manufactured in the United States and imported from export merchants in Japan. There was often no indication to show that they were American goods, and consequently Japan received the credit for the manufacture of high-grade articles which subsequent shipments proved that she was unable to supply from her own factories.

It is in Great Britain's staple trade with India, *viz.*, cotton yarns and piecegoods, that the most serious inroads have been made, and that Japanese competition in the future is likely to be most permanent and insistent. In the last year, ending 31st March, 1919, the relative proportions of the quantitative imports

from the two main sources of supply were as follows :—

Imports.	From the United Kingdom. Percentage.	From Japan. Percentage.
Cotton yarns	25·2	71·6
Cotton piecegoods— ...		
Unbleached	64·3	35·5
Bleached	95·9	3·7
Coloured, printed or dyed	88·5	9·2

Japanese yarn imports into India during that year were valued at 3,553,000*l.* and piecegoods at 7,097,000*l.*, as compared with 82,000*l.* and 192,000*l.* in 1914-15, showing an increase of no less than 4,200 and 3,600 per cent respectively.

It is not only the increased quantities, but the wider range of articles shipped, which is important. The entry of Japanese bleached, dyed, printed and coloured woven goods into the market on a fair scale is an earnest of the competition which may be felt in later years when the extensions to the machinery and plant in Japan, now either planned or in execution, become operative.

It is noteworthy that the complaints from Indian dealers in textiles with regard to the inferiority of Japanese shipments are not so frequent as those from importers in other trades. There is apparently much greater regularity and conformity to basis sample in piecegoods shipments than in other articles. This is probably due to the fact that the cotton industry in Japan has been a well-organized factory industry for some time, and the whole of an order would normally be executed by one mill, whereas in other goods, owing to the prevalence even to-day of cottage industry work, shipments against an order are probably collected from a dozen or more different small makers. Moreover, Japanese spinning and weaving companies are large and powerful concerns with ample capital, and their interests are carefully fostered by a strong and representative millowners' association. Although there is considerable direct trade between export shipping merchants in Osaka and Indian importers, the bulk of the imports are consigned to the Indian branches of two large Japanese houses, the Mitsui Bussan Kaisha and the Nippon Menkwa Kabushiki Kaisha (Japan Cotton Trading Company), who have to consider their own reputation in the local market.

The future trend of exchange is likely to have a considerable influence on Japanese competition. The recent advance in the sterling rates of the rupee from 1*s.* 4*d.* to 1*s.* 8*d.** has given the imports from countries on a gold basis, such as the United Kingdom, America and Japan, an advantage of 20 per cent; that is to say, the prices of United Kingdom, American and Japanese goods expressed in rupees are reduced by 20 per cent. Theoretically, the exchange rates on Japan should follow these on London within very close limits. In practice, however, though the telegraphic transfer rate on London has advanced approximately 25 per cent, the telegraphic transfer rate on Japan during the same period only shows an advance of, say, 17 per cent, taking the highest and lowest points reached. At present the telegraphic transfer rate on Japan shows an advance of only 14 per cent compared with 25 per cent on London. The reason that the Japanese Exchange has not responded in the same proportion is that the telegraphic transfer rate between Japan and London has also fluctuated. In January, 1917, it was about 2*s.* 1½*d.* against 2*s.* 3⅜*d.* at the present time.

More important still, the high exchange operates in precisely the opposite way in the case of exports from India; that is to say, the prices of Indian produce as expressed in the gold currencies of overseas importing countries are raised by the same proportion. Now Japan imports 60 per cent of the raw cotton used by her textile trades from India (28 per cent from the United States, 7 per cent from China and 3 per cent from Egypt), so that

* It has since risen to 2 s. 9d.

the high prices expressed in gold yen, at which she will have to purchase her raw material, must be reflected by enhanced rates for the manufactured piecegoods. On the whole, therefore, the rise in exchange should not only greatly benefit Lancashire by reducing piecegoods prices in India, but should improve her position *vis-a-vis* Japan, the prices of whose goods will not be reduced in the same proportion.

(*b*) The competition of Japanese merchants in India, both in the export and import trades, with corresponding British houses is likely to be most severe in future. The Japanese have a very great advantage in the low scale of their working expenses. Assistants and clerks are readily obtained from Japan at very meagre salaries, often little more than half of those paid by European houses. The standard of living of these men is much lower than in the case of a European. They live their own lives in large chummeries and do not mix socially with the outside world, so that they do not incur any of the ordinary expenses of clubs, entertaining, etc., and consequently, spend very little in the country. They do not object to be stationed in remote districts in the mofussil and to live under conditions which would not be tolerated by the British assistant, for pay on which he could not exist. The Japanese are great workers. Those who live abroad have very few interests outside their work, and devote their whole energies to business. Although they cannot be said to be popular in Indian circles, they seem to understand the subtleties of the Indian mind in a way which the European merchant never attempts to do. This may possibly, to some extent, be due to the proficiency they acquire in the language.

Apart from the Bombay mills, Japanese firms are the largest buyers of raw cotton in India, and maintain their own purchasing agents, ginning stations, etc., in the cotton districts. It is extremely likely that, sooner or later, an attempt will be made to utilise this staff and organization, for the direct distribution and sale of imports to the consumers, this elimination to the present elaborate and ramified system of brokers, dealers and merchants at the ports which greatly enhances the cost of the goods to the consumer. This practice has been adopted by Japanese firms with success in China, although in some ways such a course in India would present greater difficulties.

The Japanese have already made a definite bid for the handling of a large share of the export trade of India. They are shipping very large quantities of jute and jute goods, wheat, oil seeds of all kinds, shellac, etc., and are dealing in practically every article of export with every part of the world. It is only to be expected that, in future, they will utilise their advantages of low operating costs to effect the purchase of these products in a scientific manner and on a large scale by the inauguration of buying agencies and depots in the districts. This is the only really satisfactory manner of working a large produce export trade and it is astonishing that, with the exception of two or three large continental firms, such as Messrs. Ralli Bros., Messrs. Volkart Bros., and Messrs. Louis Dreyfus and Co., this course has not been more widely adopted by the British merchants in India. There is a tendency among many of our British produce firms to take the line of least resistance. The social amenities are pleasanter at the ports, and the necessity of keeping a vigilant eye on conditions, prospects and prices in the producing districts was not apparent in the past. In consequence, they have usually confined their activities to Calcutta, Bombay, Karachi and Madras, and have relied upon their banians and brokers to keep them informed of local conditions up-country. The result is that, speaking generally, the continental firms with their own depots and European travelling agents in the districts are infinitely better informed on crop prospects and can make their own estimates of the market with a reasonable degree of accuracy. The same

scientific methods are now being adopted by the Japanese, and in a very few years' time it is probable that they will have an organization in the mofussil every whit as efficient as any now existing.

The leading Japanese merchant firms in India are large houses, with ample financial resources and good connections throughout the world. There is not a British merchant house in India with the financial backing, political influence, or elaborate organization possessed by the Mitsui Bussan Kaisha, which has a paid-up capital of 8,000,000*l*., branches all over the world, and such close connections with Government, banking, shipping and industrial institutions in Japan that it may almost be said to be a quasi-official organization. Other Japanese houses in India, though smaller, are still extremely powerful firms, well known throughout the Far East, but apparently not appreciated in this country, because they are only recently established here. I doubt whether the local British merchants even yet realise the formidable nature of the competition they are now called on to meet, which is likely to become even more acute in the near future.

Based on a report by Dr. Weizmann on his return from Palestine, a programme has been drawn up by the Zionist Organization for immediate work in connection with the Hebrew University, the foundation stone of which has been laid on Mount Scopus, Jerusalem. It is proposed to establish in the house of Lady (Gray) Hill on the site: A Physical Research Institute; a Chemical Research Institute; a Micro-Biological Research Institute, in a temporary building to be erected; two lecture rooms; a number of small rooms for lectures, administrations, etc.; and two reading and reference library rooms and a library. A start is to be made with a Hebrew Institute and a general course in arts. The plans for a noble range of buildings with a magnificent dome are now in London, and will shortly be made public,

TRADE RELATIONS BETWEEN ENGLAND AND INDIA.*

By A. V. Ramanathan, B.A.

INDIA has worked out her previous *karma* and is now on the threshold of a new era of reconciliation, emancipation and progress. Her Government will shortly be substantially representative. The people and the Government alike have awakened to a sense of the importance of fostering local industries, and the bitterness of past controversies has been laid at rest by a recognition of India's right to determine her own tariff policy. It is singularly inappropriate that at a time like this, Professor Hamilton of the Calcutta University, should have published under the guise of dispassionate study of facts, a biassed work on a highly controversial topic and thereby stirred up the embers of forgotten differences.

The theme of Professor Hamilton's work is the determination of the decree to which English commercial policy was responsible for reducing India from an economical self-sufficing country with a substantial surplus of manufactured and raw products for export, into one entirely dependent on the outside world for her requirements, alike in peace and war. That such a transition has taken place does not admit of controversy. As the Indian Industrial Commission point out, "At a time when the West of Europe, the birthplace of the modern industrial system, was inhabited by uncivilised tribes, India was famous for the wealth of her rulers and for the high artistic skill of her craftsmen. And, even at a much later period, when merchant adventurers from the West made their first appearance in India, the industrial development of this country was, at any rate, not inferior to that of the more advanced European nations."

* By Professor C. J. Hamilton, M.A. Thacker Spink & Co., Calcutta.

But at present to quote the words of RushBrook Williams in his "India 1917-18," "While India produces nearly all the raw materials necessary for the requirements of a modern community, she is unable to manufacture many of the articles and materials essential alike in peace and war. India is a country rich in raw materials and industrial possibilities, but poor in manufacturing accomplishments."

It is admitted on all hands that this change took place principally and prominently in the later half of the 18th and the first half of the 19th century. The theory with reference to this transition which Professor Hamilton desires to controvert is to quote his own words, as follows:—

"The methods by which this destruction of Indian industry was said to have been carried out were in the main a series of tariff laws excluding, or heavily penalizing, the import of Indian goods into England *while subjecting the Indian manufacturer to the full force of English competition in the home market.* When at a later date, England had adopted free trade she is said to have again crippled the industrial expansion of India by enforcing upon her a free trade policy, and, in particular, by the imposition of an excise duty upon cotton fabrics as the result of which the nascent machine industries of India are thought to have been disabled from competing on equal terms with the rivals of China and Japan."

In addition to these Professor Hamilton singles out also for attack the following statement of Brooks Adams in his "Law of civilization and decay." "Very soon after Plassey, the Bengal plunder began to arrive in London and the effect appears to have been instantaneous for all authorities agreed that the Industrial revolution began with the year 1760."

Professor Hamilton tells us that the above theory results almost entirely upon an one-sided and inaccurate interpretation of economic history and asserts "India was never a great manufacturing country except in respect of hand spinning and weaving." He proceeds to say that "the loss by India of her export markets and even of her home market was the inevitable result of an unequal fight between the handicraftsmen and the machine product. The high English import duties were neither directed against the Indian cotton manufacturers nor did they play any important part in determining the outcome."

This is the conclusion that he wants us to accept by a study of his book and we may now proceed to examine the materials on which Professor Hamilton builds up his conclusion.

Professor Hamilton rightly divides the period of Indo-English commercial relations into three distinct periods.

(1) 1600 to 1765 being the period of commercial intercourse of an equal basis, during which India was under native rule and the East India Company was mainly a trading body. This period marks also the inception and growth of mercantilism in England, that is "of the policy that the State should legislate on matters of trade with the purpose of controlling private enterprise in the interests of the nation with the three-fold object of (1) protecting the special manufactures of the country, (2) securing a favourable balance of trade as the result of her imports and exports, and (3) extending by all possible means the growth of the mercantile marine."

(2) 1765-1858. This is the period of the growth of Company's sovereignty in India accompanied by a change in the character of the company's trade in its first half and by the extinction of the Company's activities as a trading body and the growth of facilities for unimpeded commerce by English merchants in India in the latter half. This period was marked in England by the industrial revolution and the growth of manufactures accompained by a rise in customs duties necessitated by the increased expenditure on the Napoleonic wars.

(3) *1858 to the present time.* This is the period of free trade alike in England and India and of the direct sovereignty of India by the Imperial crown and Parliament.

Before proceeding further, it is necessary to point out how largely Professor Hamilton draws upon his own imagination in support of his arguments without giving any contemporary evidence in support of the same. Almost at the beginning of his work he says "one of the curious facts concerning early descriptions of India is that the country is constantly spoken of as remarkable for its great wealth while it is no less common to find the extreme poverty of the great masses of people emphasised as its predominant characteristic."

"When India and the East were spoken of as a source of great wealth by the early European traders, it is probable that the chief reason is to be found in the fact that the trade afforded opportunities for exceptional profit to individuals."

We are not aware of any authority for these statements. On the contrary, readers of the works of Early English Administrators in India will constantly find evidence of how contented, happy and prosperous the general population were in those days. The evidence of Buchanan's journals goes also to discount the correctness of Professor Hamilton's assertion.

We need not follow Professor Hamilton through his description of the activities of the Company during the first period or the growth of English commercial policy during the same. During the whole of this period the Company had to pay for what it took from India by means of European goods or money. Though the Company's trade had the benefit of low import duties, there were no other advantages that the European traders had over Indian merchants and manufacturers. Further the interests of the Company lay in increasing the volume of its business and there were no manufactures in England competing with India. The only principle of English trade policy during this period which affected India adversely was the prohibition of the export of gold from England, but this did not operate much in practice as the Company found that they could not get Indian goods except for cash and consequently got the permission of the English Government to export a limited quantity of silver for their requirements in India. It is worthy of note, however, that even Professor Hamilton has been compelled to give an instance of how when Indian imports were suspected to compete with English industries prompt action was taken even during this period, to subject the imports from India to special heavy duties. He says "Not until the importation into England of unusually large quantity of muslins and calicos did the manufactures of India come into direct competition with the industries of England and not until then did the qnestion arise of restraining the admission of the former in the interests of latter." But the question did arise in respect of these muslins and calicos and with the following result.

"The popular writers of the day began to prophesy disastrous results to the home manufactures. In 1681 the silk weavers of London petitioned the House of Commons against the wear of East Indian Silks and Cottons. In 1697 they became outrageous on the ground that silks and calicos and other Indian manufactures imported by the East India Company were worn by all sorts of people" and though economists like Davenant argued in vain that "trade is in its nature free, finds its own channel and best directeth its own course," an act was passed in 1700 laying *further duties* on wrought silks, muslins and commodities of the East Indies with a view to provide for the more effectively employing of the people by increasing manufactures of this Kingdom. Nor was this all. The act laid down also "that from 1st June, 1701, the wrought silks, Bengalls and stuffs mixed with silk and huba and all

calicos, painted, dyed, printed or stained and which are or shall be imported into this Kingdom *shall not be worn or otherwise* used within this Kingdom."

The extent to which Professor Hamilton's views are biased will be clear from his attempt to explain away the above restrictions by saying that imports were still permitted for purposes of re-export. Indeed Professor Hamilton's argument in this respect is of a piece only with his claim for India's gratitude on the score that "the net results of England's trading relation with India must have been a very considerable increase in the total export of Indian textile goods" inasmuch as "England brought her a body of energetic traders having at their command a large number of ships." Great philanthropy indeed!

Another argument advanced by Professor Hamilton in vindication of the above restrictions is that they were not isolated examples of discrimination on the part of England but formed part of England's general trade policy from which Irish manufactures also sufferred. The retort for such an argument is obvious.

The interest of the question centre wholly round the second period 1765-1858. During this period the Company gradually consolidated its power and established its sovereignty throughout India. As opportunities for trade in India increased, the English people and the Parliament gradually abolished company's monopoly and threw open the Indian trade to private merchants. The consolidation of Company's rule led to the opening up of the country and increase of facilities for the commercial penetration of the interior. Meantime for the first 60 years of this period the Company's trade assumed a forced character for the annual export of Indian goods to England or "the investment" as it came to be called, began to assume the nature of tribute, that is payment without return. During all this period the industrial revolution gradually took place in England and British manufactures developed while the old mercantalist policy assumed a pronouncedly protectionist form involving not merely a high range of import duties but also prohibition of importation in certain cases and of export of machinery and of emigration of craftsmen.

To quote Professor Hamilton "The period of early British rule is commonly described as the darkest age of Indian economic history. The decay of commerce, the destruction of native industries and the general impoverishment of the people are commonly emphasised as the chief results of the English conquest."

It is in dealing with this period of Indo-English relations that Professor Hamilton's logic is at its worst. He furnishes with facts and figures in support of every line of the summary above given by us. He gives us contemporary evidence of Indian prosperity before 1765, of interference with Indian manufactures by the Company's servants and agents, of the evil effects of the invasion of English agency into the inland trade surreptitiously at first and regularly thereafter of the forced character of the Indian export trade, of protests by contemporary writers of the baneful effects alike of forced exports and the withholding of specie from India in return, and also of the presence of high import duties in England against Indian manufactures and of the prohibitions above referred to. The only point in respect of which he is not prepared to admit that there is contemporary evidence is that there was any export of specie to England during the period by the Company or its servants representing the "Bengal Plunder."

But what is amusing in Professor Hamilton's reasoning is the manner in which he attempts to explain away all the above evidence to avoid the obvious inference which they lead to. To take the above items serially

(I) Indian prosperity before 1765.

We have already remarked how he would have us qualify evidence of Indian prosperity

by showing that the great masses of people were extremely poor and that the value of India's manufactures has been exaggerated. We have also shown already how such a statement is unwarranted and unsubstantiated by any contemporary evidence. We need only *quote one contemporary witness here:—*

SIR THOMAS MUNROE:—"If a good system of agriculture, *unrivalled manacturing skill, a capacity to produce whatever can contribute to convenience or luxury*

* * * *

are among the signs which denote a civilised people, then the Hindus are not inferior to the nations of Europe; and if civilisation is to become an article of trade between the two countries, I am convinced this country (England) will gain by the import cargo."

(2) Interference with Indian manufactures by the Company's servants and agents.

The extenuation attempted in this case is as follows:—

"It is not to be supposed that these practices were new in the histories of the country. Monopolies of the harshest character had frequently been established in the days of native rule particularly in the time of Shaistakhan" he neverthless admits "it is none the less true that the final break-down of Indian Government after Plassey and the transference of authority to the hands of a small body of men scarcely aware of their new responsibility and ignorant of the means to give it effect afforded the opportunity for the force of lawlessness and oppression to appear unrestrained."

Professor Hamilton argues also that the effect of the Company's activities in restraint of trade has been unduly exaggerated by a wrong interpretation of the following orders of the Court of Directors:—

(i) In connection with ensuring that all silk winders should be encouraged to work in the Company's factories and if necessary forced to work there, the Directors ordered as follows:—

"Should this practice (winders working in their homes) through inattention have been suffered to take place again it would be proper to put a stop to it which may now be more effectively done by *absolute prohibition* under severe penalties by the authorities of the Government." (ii) In connection with the difficulty met with by them in getting their investment cheaply enough, the Directors ordered "finding it our indispensable duty to strike at the root of an evil with has been so severely left by the Company and which can no longer be supported, we hereby direct that all persons whatever in the company's service or *under our protection* be *absolutely prohibited* by public advertisement from trading in any of those articles which cimposed our investment, directly or indirectly except on account of and for the East India company until their investment is completed."

Professor Hamilton, however, argues that the first order applied only to such winders as had contracted to work in the company's factories but subsequently stayed away from them and that the second order was directed towards preventing the Company's servants from competing with the Company in the purchase of articles forming the "investment" and did not apply to private merchants.

In construing such orders, however, we have to note the significance attached to them by business men and writers of the time, in the ordinary course of their business, and not the meaning that could be read into them by a process of abstract reasoning from a University armchair after the lapse of over a century and a half. As an instance of how this prohibition worked we may quote the following from William Boats, an English merchant writing in 1772. "The winders of raw silk have been treated also with such injustice that instances have been known of their cutting of their thumbs to prevent their being forced to wind silk." "The baneful effects of (the Company's restrictions)

are severely felt by every weaver and manufacturer in the country, every article produced being made a monopoly."

(3) The forced character of Indian export trade.

The Change that came about in the charcter of Indian trade with England about this period may best be described in the following words of Shore and Wingate.

SHORE.—" The Company are merchants as well as sovereigns of the country. In the capacity they *engross* its trade whilst in the latter, they appropriate the revenue. The *remittance to Europe* of *revenues made in* the commodities of the country are purchased by them.

There is reason to conclude that the benefits (of our rule) are more than counterbalanced by evils inseparable from the system of the remote foreign dominion.

Returns of specie and goods were made through the (trade) channels of Arabs by that of the foreign European Companies and in gold dust for opium from eastward.

But from the year 1765 *the reverse has taken place. The Company's trade produces no equivalent returns.*

Upon the whole, I have no hesitation in concluding that since the Company's acquisition of the Diwani the current specie of the country has been greatly diminished in quantity, that the old channels of importation by which the drains were formerly replenished and that *the necessity of supplying* China, Madras and Bombay with money as well as the exportation of it by Europeans to England will continue still further to exhaust the country of its silver."

SIR GEORGE WINGATE:—" With reference to its economical effects on the *condition of India, the tribute paid to* Great Britain is by far the most objectionable *feature in our existing policy. Taxes spent* in the country from which they are raised are totally different in their effects from taxes raised in one country and spent in another. In the former case the taxes collected from the population at large are paid away to the por*tion of the population engaged in the service* of Government through whose expenditure they are again returned to the industrious class. They occasion a different distribution, but no loss of national income. But the case is wholly different when the taxes are not spent in the country from which they are raised. *In this case they constitute no mere* transfer of a portion of the national income from one set of citizens to another, but an absolute loss and extinction of the whole amount withdrawn from the taxed country. *The whole amount might as well be thrown into the sea.*"

Professor Hamilton while admitting the transference of wealth from India to England without any equivalent return argues that specie did not form any part of such tribute. His main ground for such an assumption is that there is no mention in the Company's records or in the records of English imports of the import of specie from India to England about this period. It would, however, be clear from the quotation given above and other contemporary writings that the transference of specie did take place though surreptitiously. But this is a minor point. The main fact is that Indo-English trade changed from one of free commerce to one of tribute during this period and if England did not get this tribute in the form of specie it got the specie from other countries by selling *the material wealth* that it took away from India. The net result was a transference of wealth from India to England and even according to Professor Hamilton's admission it amounted to a million and a half a year; though the details given by him total an annual drain of two millions and contemporary evidence places it even *slightly higher*. The extent to which India was drained can be realised *from the following* evidence *furnished* by Professor Hamilton himself of India's gain as the result of normal trade established in another direction :—

"Gradually the tide turned and once more bullion began to flow *on balance* into Bengal at a considerable rate. For the 11 years 1795-1805, treasure was brought into Bengal from America to the value of *three crores seventy three lakhs*. The import of treasure from all sources including China in the same period was eight crores sixty lakhs."

The next statement sought to be controverted in this book before us is that of Brooks Adams quoted in the earlier part of this review. But that is not an isolated sentence. Brooks Adams says also "In themselves inventions are passive many of the most important having lain dormant for centuries waiting for a sufficient store of force to have accumulated to set them working. The store must always take the shape of money and money not hoarded but in motion. The arrival of Bengal Silver not only increased the mass of money but stimulated its movement. The influx of Indian treasure by adding considerably to the nation's cash capital not only increased its stock of energy but added much to its flexibility and the rapidity of its movement." Even Professor Hamilton cannot be wholly unaware of the treasure which reached England from India if not in the form of specie at least in the form of material goods the value of which was retained there. He attempts to controvert the argument of Brooks Adams by saying "As a matter of fact a brief reference to the economic history of the 18th Century will reveal the complete lack of foundation for the view put forward by Brooks Adams which represents the industrial revolution *as commencing suddenly with the year 1760*." He proceeds to state that the inventions of the smelting of iron by means of coal, of the flying shuttle and of the spinning jenny had taken place much earlier than 1760. He has nevertheless to admit that the first weaving mill in England was erected only so late as 1719 and that it was not until 1802 that the new invention ("Power Loom") began to be established with commercial success. He adds also "during the 18th Century the great advance in English cotton manufacture was confined to spinning and *this took place after 1780*, the first steam spinning mill being started in 1785.

One fails to understand where the defect in Brooks Adams' reasoning steps in.

We now come to the last item, namely the effect of high import duties in England against Indian manufactures. The manner in which Professor Hamilton explains away this factor is two-fold :—

(1) That the tariff was not directed solely against India but was part of the general commercial and industrial policy of England. Quite so. The succession of the United States and the Irish question are also the fruits of that policy.

(2) "All that the additional import duties can have effect was to have slightly hastening the day when both the East India Company and the private merchants recognised that the import of Indian cottons could not be profitably continued. No impartial student can find in the tariff a sufficient explanation either for the successful development of English cotton industry or for the loss of the English market to the cotton weavers of India. Even if the tariff afforded some assistance to the English producers in establishing a footing in the home market it could not have explained their successful entry into the market abroad."

All this may be perfectly true. That the English industries profitted to a considerable extent by the policy of protection is, however, borne out considerably by contemporary evidence. For example when the Company ceased to be a commercial body and began to take a greater interest in the trades and manufuctures of India they petitioned Parliament on the 11th February, 1840, for the removal of invidious duties which discouraged and repressed Indian industries.

A select committee of the House of Commons was appointed to report on the petition and the evidence of British manufacturers before that body gave ample testimony to the extent to which they relied upon the policy of protection for the success of their manufactures. Arnold Tonybee also says in his "Industrial Revolution of the 18th Century in England" as follows :—

"English industries would not have advanced so rapidly without a protection but the system once established led to perpetual wrangling on the part of rival industries and sacrificed India and the colonies to our great manufactures." This, however, is not our main concern. The burden of Indian criticism has all along been directed *towards the policy of increasing freedom of trade in India simultaneously with increasing protectionist duties in England.* The combined effect of these two policies will be evident from the following extracts of the contemporary writers."

"Montgomery Martin 1837. Under the pretence of free trade, England has compelled India to receive the products of the steam mills of Lancashire at mere nominal duties while the hand-wrought manufactures of Bengal and Bihar beautiful in fabric and durable in wear have had heavy, almost prohibitive duties imposed on their importation into England."

J. C. Melvill 1840. "I have no doubt that great distress was the consequence in the first instance of the interference of British manufactures with those of India."

William Larpent 1840. "I submit on principle that India ought to be admitted as one of our own possessions. The argument has been used that while our manufactures are allowed to go into India at a very reduced duty we ought to have admitted theirs on as low a duty as possible. There is no colony of this country whose manufactures are of a magnitude similar to that of India and calling for such treatment. *We have destroyed the manufactures of India.*"

On being asked whether it would not be more desirable perhaps that India should produce the raw material and England show its skill in perfecting it Mr. Larpent said, "the course of things in India is decidedly leading to that, but I submit that as this, (silk manufacture) is the last of the *expiring manufactures* of India, the only one, where there is a chance of inducing the native manufactures at least let it have a fair chance and not be oppressed with the duty of 20 per cent in favour of the British manufactures."

Montgomery Martin, 1840. "I have examined at considerable length and for a series of years the trade of India, and I have been impressed with the conviction that India has suffered most unjustly in her trade not merely with England *but with all other countries*, by reason of the outcry for free trade on the part of England without permitting to India a free trade herself. If the cotton manufactures of England are only to be retained at the expense of injustice to India my answer is that England ought to add with justice, no matter what the result may be, that she has no right to destroy the people of a country which she has conquered, for the benefit of herself, for the mere sake of upholding any isolated portion of the community at home. *I do not agree that India is an agricultural country. India is as much a manufacturing country as agricultural* and he who would seek to reduce her to the position of an agricultural country seeks to lower her in the scale of civilization. To reduce her now to an agricultural country would be an injustice to India."

Says Professor Wilson in his "History of India"

"English manufactures were created by the sacrifice of Indian manufacture. *Had India been independent, she would have*

retaliated. She would have imposed prohibitive duties on British goods and would thus have preserved her own productive industry from annihilation. This act of self-defence was not permitted her, she was at the mercy of the stranger."

We need not labour the point further, the history of the U. S. A., Germany, France and Italy show what Protection could have done for India. Coming now to the third period 1858 to the present time, India has had free trade with England and the trade has run on normal lines, except for the "home charges." This is also the period of direct Parliamentary administration of India. The principle features of this period may be summarised as follows:—

In 1859 India had for the purposes of revenue to levy a high range of customs duties. An important consequence of the new tariff was that the duties of British cotton were double and in some cases quadruple. The Bombay Importers declared that they could not under the new tariff meet the competition and the Indian factories in the manufacture of cotton goods. The familiar argument of protecting the Indian consumer in the enjoyment of his cheap cloth resulted in the amendment of the tariff in the very next year by reducing the rate of duty on cotton goods by one half and increasing at the same time the low favourable duty on cotton twist and yarn which had been fixed in the previous year. Indian cotton industry agitated that the raising of the duty on yarn acted as a serious handicap on the raising cotton manufacture of India and the duty was again lowered to its former level in 1861. This led to agitation in favour of reduction of the duty on the finished product also which is again reduced by one half. Indian yarn, however, being continued its preference by being taxed at 3½ per cent *ad valorem* against 5 per cent of finished goods. But the British manufactures were not content and again in the guise of advocating the interests of the Indian consumer urged the abolition of the duty on cotton cloth. When the Government of India, however, pointed out that the duty was necessary for revenue purposes, the alternative suggestion of imposing an excise duty on Indian muslin products was trotted out. It is a matter of common knowledge how eventually a plausible solution was reached by the abolition of duties on all cotton goods in 1882 in taking the advantage of the considerable surplus revenue that Government had at the time and in obedience to resolutions passed in the House of Commons that "the duties levied upon cotton manufactures imported into India being protective in their nature are contrary to sound commercial policy and ought to be repealed withont delay as soon as the financial conditions of India would permit."

It is needless also to revive memories of the controversy that centred round the imposition of an excise duty on Indian piece-goods as the result of an agitation set up by Lancashire when the re-imposition upon import duty on their goods was found necessary in 1894 as the result of the fall in exchange and defects in the Indian Budget. Thanks to the change in the angle of England's vision towards India, this controversy has been set at rest and indeed India has been accorded to some extent a voice in the shaping of her own tariff policy in supersession of the dictum of Lord Salisbury as Secretary of State, that the settlement of such a question rested entirely with the Secretary of State.

The Industrial future of India is now fairly assured and it behoves all sections of His Majesty's subjects, Englishmen and Indian alike, to obey his majesty's behest and conduct themselves with "mutual forbearance" avoiding the rekindling of forgotten controversies.

ECONOMICS IN THE WEST.

After-War Difficulties.

London, 18th March, 1920.—Perhaps the most important event affecting the economic and industrial situation that has occurred since I last wrote is the vote of the Trade Union Congress against "direct action" to "compel" the Government to agree to nationalisation of the coal mines. This adverse vote against the favourite principle of the Labour extremists—our "Bolshies" as they are not inaptly described by the popular voice—is not only remarkable in itself but it is notable for the decision with which it was given. The votes were in about the proportion of three to one against—a quite extraordinary weighing down of the scale against the firebrands. The *Times* describes the episode as the turning point in the after-war difficulties. In that view the bulk of careful students of popular opinion will be disposed to agree. The voice of reason is now being listened to where a few months since it was scoffed at. The working classes are more and more getting to understand that violence and intimidation will not advance their cause, but rather will in the long run deprive them of advantages which they have gained by generations of strenuous agitation. It is true that the miners are still aggressive hoping by impossible demands for increased wages to obtain the ends they previously sought by "direct action." But the last word has not yet been said on their impudent claims and it is significant that at a popular Trafalgar Square demonstration on Saturday they were denounced in set terms by speakers with the enthusiastic approval of the crowd.

It is no small thing that there should be at this juncture a greater disposition to peace in the industrial world. Not from one part of the globe but from practically every well-known commercial centre comes the cry for British goods. Customers in some cases are prepared to pay almost any price for certain lines of goods of which they have a shortage. Especially is this the case in regard to textiles—wollen and cotton goods—which are required in such quantities as to keep the looms of the Northern factories occupied to their greatest capacity. The result of this phenomenal prosperity in industry is neglected in the financial columns of the daily press which are crowded with applications for new capital. It is said, and I believe with truth, that last week's new issues totalled a sum in excess of the aggregate of any busy week in the year before the war. This rush for money is a natural and for the most part healthy outcome of the period of reconstruction; but I am afraid that a good many investors will loom their fingers badly if they do not carefully discriminate between the enterprises that are figuring in the market for new capital. Most of the applications are based on the returns of profits of the last few years when conditions were altogether abnormal. How certain it is that when the post war demands have been satisfied there will be a reaction which will shake the position of not a few of these at present highly prosperous concerns.

British Industries Fairs.

Optimism, however, is a note which may justifiably be sounded by British manufacturers guite apart from the extracrdinary prosperity of special industries. There is now a spirit abroad in the country which makes for confidence—a healthy, invigorating tendency certain to carry us far in the race now proceeding for commercial predominance. No one could have visited the British Industries Fairs recently held under official auspices in London, and at Glasgow and Birmingham without being most deeply impressed with the evidences that he saw all round him of the stirring of new forces in the realms of industry. The old happy go

lucky, hit or miss methods so long characteristic of large sections of our manufacturers were pleasingly absent. In their place were found a keenness and resourcefulness and above all an originality most welcome to all who realise that we are standing on the threshold of an epoch which may be as fruitful for British trade as that which was opened by the peace following the Nopoleonic Wars. If the spirit is maintained there can, any way, be no doubt that we shall recover most of our lost markets and capture the business of a good many places to which before the war we could not find access.

It would be impossible to enumerate a tithe of the articles which were displayed on the stalls at these recent exhibitions. But it was not merely the enormous range of our manufactures which struck one: it was the great and successful effort that is being made to occupy ground which was once the special preserve of Germany. In the past few years vast industries have been created, a direct outcome of the national determination to be no longer dependent on foreign sources for vital articles. Dyes, of course, are a conspicuous case in point. The British industry is now producing enormous qnantities of dyestuffs in ranges of colour which before the war would have secured quite beyond the capacity of the British manufacturer. It still has a good deal to accomplish before it fully occupies the position held by Germany in earlier years. But there is an excellent guarantee in what it has already done that it will not disappoint the sanguine expectations of its future entertained when the movement for establishing a British dye system was started. The British Glass Industry is another interest which is showing very well in this after-war period. The old story of British dependence on enemy countries for glass and especially for optical glass, need not be re-told. Of all the unsatisfactory minor chapters in the war none was more humiliating than that which revealed the difficulties in connection with gun sights and optical instruments because we could not manufacture them. Now the conditions are so entirely different from what they were as to constitute a revolution in this particular trade. In pre-war days reliance was largely placed on hand labour. In the last few years machinery has been installed almost everywhere in the glass trade with the result that the output has been enormously increased and with it the possibilities of a permanently lucrative trade. A striking example of what is accomplished by the new methods may be given. A machine employed in the manufacture of lamp glasses turns out in an eight hour shift 24,000 articles. The only labour required to produce this large output is a mechanic and two boys. Under old conditions the services of 180 men and boys were required to manufacture 500,000 articles per week. Glass tumblers, or drinking glasses, by the use of machinery can now be produced at the rate of 30,000 per eight hour shift where in former days with hand labour only 500 per shift were forthcoming. When we turn to the finer class of optical glass we find that equally good progress has been made. Indeed, throughout the whole range of glass making British manufacturers have established themselves in a position which will make it very difficult for foreign competition to gain any new foothold in our home market while British glass will be a formidable rival to foreign made glass abroad. It is well that we should keep these facts before us in making our after-war survey. They help to dispel the unpleasant impression that may be created by incessant labour difficulties and protracted unrest in the industrial sphere.

British toy making has made giant strides since those early days of the war when the door was barred on the once ubiquitous German toy. At the recent exhibitions there was a really remarkable display of toys in an

infinite variety of types and styles of manufacture. They were by no means slavish repoductions of the old familiar German toys, but often quite original productions calculated to appeal to the infantile mind with even greater force than the goods they have displaced. Substantial as the progress made in the domestic toy trade has been there is still ample room for enterprise if the British made article is to fill the void left by the Germans. In this work of building up a British toy trade India might appropriately lend assistance. We import annually tens of thousands of pounds worth of Japanese toys and they are eagerly bought, but so far as I have been able to discover little or nothing in this line comes from India. Yet, surely, your country is admirably adapted for toy making of the class which is popular in the West. You have cheap and intelligent labour, ample supplies, in the hilly regions at least, of suitable material and the right type of genius for the production of such goods. There need be no slavish imitation of European models. Indeed, to be really successful an industry would have to develop a style of its own—one which would be racy of the country and yet appeal to the childlike mind which is much the same the wide world over—differences of race and creed notwithstanding. Perhaps some Indian capitalist will take the matter up. By doing so he would serve Indian interests and at the same time add a new joy to the life of the young whose insatiable demand for something new is a real care to the head of the family when each recurring festival arrives and presents have to be bought for the inmates of the nursery.

SCIENTIFIC AND INDUSTRIAL RESEARCH.

The policy of research followed by the Government during the war is being placed on a permanent footing by the establishment in suitable centres of associations charged with the duty of conducting investigations on a systematic plan. One such body to safeguard the interests of the non-ferrous metal trades has just been started on its career at Bermingham, the home of the metal industry. The special province of this association will be the whole range of non-ferrous metals, including copper, brass, zinc, aluminium, gold, silver, etc. Its objects are defined as "to arrange for the carrying out of scientific and industrial research and the dissemination among its members of technical and other information relating to the production, treatment, manufacture and uses of non-ferrous metals." The membership of the association will be conferred to British firms and will involve an annual subscription, based upon the capital employed in the business, except where a firm's capital is partly employed in other than non-ferrous metal work in which case the firm's subscription will be specially assessed. The programme of work in contemplation is a comprehensive one. It embraces a wide field of research in all the deparments of the special industry with which the association is connected. Power has been taken to encourage the training of expert research workers and to improve the technical education of persons engaged or likely to be engaged in the non-ferrous metal industry. Such admirable results were obtained from the research committees established during the war that it is confidently expected that the association will speedily justify its existence. More and more, indeed, it is becoming evident that it is through such agencies as this association the country's industry will advance to the high position which is marked out for it by the events of this extraordinary period in the world's history.

In referring to research work I must not omit to take note of the remarkable success that has been secured by British manufacturers in the production of photographic materials. In the pre-war period we were almost entirely dependent upon foreign—chiefly German sources—for the necessary

appliances and material for photography. What has been done in the matter of the manufacture of optical glass has already been noted. Similarly satisfactory results have been obtained in regard to chemicals. Thanks to the work of our research chemists, as a writer in *Trade Supplement of the Times* shows, we now have British amidol, British metol and British hydro-quinone, and all three chemicals are quite equal to the German quality. Metol and amidol are being produced in commercial quantities and are being exported to overseas dominions, the United States and many foreign countries. Hydro-quinone will follow as soon as the erection of the necessary plant permits of it. In regard to cameras the experience gained during the war in the manufacture of aeroplane cameras in great numbers by the British Camera Factories is being turned to good account and helped by mass production of an intelligent kind these establishments are putting upon the world's markets great numbers of popular folding and pocket cameras. The greatest triumph achieved by the British manufacturers, however, has been in the production of dry plates and sensitized paper. A speciality is a colour sensitive plate used with remarkable effect during the war by our aviators to photograph the features of the country. This plate, which rendered the art of comouflage useless in many cases because objects were revealed in their true character in spite of disguise, is most valuable in certain classes of photography and undoubtedly has a great future. Roll film of a quality which will compare favourably with that made in any other country is also being produced, and supplied in ever increasing quantities to customers abroad. In fine, the British photographic material industry is in a stonger position than it has ever before been in its history and the time seems to be coming when it will be pre-eminent in its own line.

ARNOLD WRIGHT.

INDUSTRIAL NOTES FROM THE UNITED STATES.

Shooting Concrete into Place by Steam.

Washington, D.C., U.S.A., Feb. 26, 1920.—"Look at this," said the manager of an electric railway company in an eastern American city to a widely known structural engineer in the spring of 1912. This engineer, in talking with the writer a few days ago, said:

"He pointed to the reinforced concrete columns, girders, and beams of a large packing house. From cellar to garret, wide cracks followed the lines of the buried steel.

"Near the packing house was a railway power plant, and the packers thought this was the source of trouble. But with suitable electrical instruments I demonstrated beyond a doubt that it was caused by electricity that had leaked from the circuits of the packing house.

"'Can you put the building into a safe condition electrically, and repair the damaged concrete?' the packers asked me.

"As an electrical and structural engineer, I felt that I could solve the first problem. But I knew nothing about concrete! Experts assured me that the repairs could be made with a machine that blew a stream of dry cement and dry sand into a jet of water. In accordance with their advice, I undertook the contract of repairing the concrete after installing the electrical protective apparatus.

"The cement-shooting machine worked well enough, but some of the fine, dry cement that escaped from the cone of the water jet rained down upon everything within a radius of eighty feet.

"'You will ruin our meat,' said the packers. The government inspectors agreed with them, and ordered me to stop.

"What was I to do? After a search, I found a machine for which it was claimed

that it would blow a wet mixture of cement and lime and make it stick. I tried the apparatus. It failed ignominiously. I sent for the inventor of the apparatus. After spending several miserable hours in the dripping wet cooling room of the packing house, he delivered himself thus:

"'Any man who tries to place new concrete on the lower edge of an old concrete beam is a fool. But any man who tries to do this in a room where the temperature is below freezing is crazy. It cannot be done.'

"But I had meanwhile been using pneumatic hammers to chip away cracked concrete four inches thick on three thousand lineal feet of beams and girders. All the lower reinforcing rods of that concrete were exposed to salt water. The building seemed doomed; also my professional reputation. I decided that I would have to design my own apparatus.

"With a motor, frame and hopper I built up a crude device that worked fairly well with compressed air. A few tests showed that the jetted concrete would hold. But why not heat the air? I made the attempt. The results were excellent in rooms where the temperature was below freezing. Engineers all over the country became interested in the work. I received orders for a number of similar machines.

"In two weeks I had the first concrete atomizer. Two machines were built and sold at once.

"Since that time I have repaired the honey-combed structure of the Lackawanna Railway terminal at Hoboken, N. J., patched the first concrete barge built in this country after it proved to be too badly honey-combed for service, and kept myself busy shooting concrete.

"At first I used compressed air. Later I became convinced that steam would give better results at a less cost.

"'It cannot be done,' said the engineers once more. 'The cold concrete will condence the steam.'

"I obtained the use of a railway switch engine for my steam plant. In order to superheat the steam and control its temperature I arranged a coil of pipe in a coke fire. From seven in the morning we worked all one June day, without stopping to eat. No success.

"At five o'clock I mixed a final load of one part cement, three of sand and two of fine pebbles with about 15 per cent of water and with steam at 300° F. A perfect stream shot out, spread evenly, and adhered to the steel work it was to cover. The next morning there was a flint-like surface better and stronger than the air-jetted concrete around it.

"That was the beginning of much railway concrete work. When I was asked by the Chicago and Great Western Railway to reline its great tunnel at Winston, Ills., I tackled my most difficult job. Over the track center the entire lower course of brick had been worn away by the combined action of the locomotive exhaust and of streams of water that seeped through under heavy pressure. Since it is physically impossible for a man to hold a two and one-half inch nozzle shooting a steam of hot concrete directly over his head a designed and placed on a flat car a motor-driven rock shaft located at the arch center, to which a flexible nozzle-holder was attached. This was mounted on a carriage, so as to be moved ten feet forward and backward by means of a hand winch, and it also swung to and from a spring-trowel device. This invention did away with hand mason work in finishing the surface. An adjoining flat car carried the atomizer and necessary materials.

"I have since worked out a modification of the nozzle car and trowel machine for making concrete roads with an upper surface that will wear as well as granite.

"Thus what seemed an overwhelming failure resulted in the invention of a new

labor-saving apparatus, new building materials, and new methods of construction."

AT LAST MOTION PICTURES THAT TALK

Hundreds of our most eminent and successful motion picture producers and inventors have been working their "thought tanks" overtime morning, noon and night trying to produce real, honest-to-goodness movies that would talk *at the right time*, with the right accentuation, and never get out of step or synchronism.

It is comparatively easy in cartoon and other movie drawings to show the words issuing from the mouths of the actors, but when living actors are employed there has not been heretofore any method whereby the words could be showu in the scene directly, although several talking machine schemes have been tried out, including that of Thomos A. Edison, the famous inventor, a short while ago. As is well known, in the talking machine scheme the speeches of the actors are "canned" simultaneously with the photographing of the various scenes, and afterward the talking machine record is run off simultaneously and synchronously with the projection of the motion picture. For several reasons this has not been entirely satisfactory, and after having demonstrated this arrangement a few years ago there has not been any presentation of the talking phonographic movie in some years.

Now an invention has been made by which the actors fairly spit out their words to portray their sayings, dialogue and conversation, and this is accomplished in the simplest manner imaginable. The letters are printed on a collapsible and transparent celluloid strip which can be extended or contracted by pressing or releasing a pneumatic bulb held in the coat pocket or in the hand, and the actor, or actress, is thus enabled to actually "speak their thoughts."

The method of accomplishing these results consists in causing a selected arrangement of letters which will spell the spoken words to appear from behind the actor, preferably from behind his head, in line with or substantially beside his mouth, while the photographing is proceeding, in order to produce that portion of the photoplay which is to be emphasized by such words or sentences.

Regarding the celluloid strip on which the letters or words are printed, this is made transparent so that the end toward the camera will not unduly contrast with the color of the actor's hair, or otherwise this strip may be colored or made to match his or her hair. The collapsible strip bearing the letters is fitted to flexible tube leading to an air bulb or bellows which may be operated by the hand or else located under the arm of the actor. When the pressure of air is created by squeezing the bellows or bulb, the quick-acting coiled tube is inflated and out pops the word or words in line with, and apparently from, the actor's mouth. As the inventor points out, even those in the audience who are experts on lip-reading will find this system to be synchronous and very natural in its presentation, as the actor can actually pronounce the words and produce the necessary facial and mouth movements as the word appears.

A LONG DISTANCE DICTAGRAPH.

The dictagraph is known to practically everyone to-day, for this wonderful scientific device has figured quite extensively in private and other investigations all over the world.

Plainly described, the dictagraph comprises a super-sensitive telephone which can pick up at a considerable distance from the transmitter ordinary speech sounds, and in some cases even whispers, and transmit them, electrically, over a circuit of considerable length to a pair of telephone receivers. The operative who makes use of the dictagraph, and who invariably has to be a shorthand writer so as to record the incoming conversations, is usually located in the same building and in some cases in the room or

apartment adjoining that in which the criminals or conspirators are located.

The dictagraph telephone circuit includes a battery, a pair of low-resistance telephone receivers wound to about four ohms each, so as to permit a fairly heavy current to pass through the circuit, and a very sensitive carbon-grain microphone.

A New York engineer has recently suggested a combination of the wireless telephone and the dictagraph, by which means the application and versatility of the dictagraph is increased many-fold.

In a building where the suspected persons have their rendezvous or living quarters, there is installed the usual super-sensitive microphone of the dictagraph outfit. This is sometimes hidden behind pictures, under tables, or other furniture, and in some cases it has been placed in the drawer of a sideboard or china closet. The wires are scrupulously concealed and installed by the detectives investigating the case, at some time when the occupants of the apartment are absent. The speech waves picked up by the microphone are transmitted to the receiver of the loud-speaking receiver of the instrument, which is secured in close relationship to the microphone of an automatic wireless telephone transmitter, preferably of the noiseless vacuum or audion type.

This latter apparatus is carefully installed in some out-of-the-way location where it is not likely to be found, and no attendant is required to stay and watch the apparatus, once it is set in action. This releases the usual dictagraph attendant for more important service. Any conversations picked up by the wireless telephone dictagraph are thus amplified and transmitted in the form of Hertzian waves from the concealed antenna whence they are picked up by the antenna of the radio receiving station located at police or detective head-quarters. Here they are transmitted into articulate speech once more, through the wireless telephone receiving apparatus, all in a well known manner.

The receiving set can be of the audion or vacuum tube type, and, as is the case with all up-to-date radio stations, it may be equipped with a vacuum type amplifier, so that the incoming messages can be intensified until they are thoroughly audible, or they may be recorded independently or simultaneously on a phonograph for further reference and record.

Life of Liberty Motor 100 Flying Hours.

In the opinion of Colonel H. H. Arnold, recognized as one of the most reliable authorities on aviation in the United States, one great result of the recent trans-continental airplane race is the definite knowledge obtained on the actual life of the famous Liberty motor.

"We have never known before that the life would be of a Liberty motor," said Colonel Arnold. "We have never tested them to the utmost of their endurance before. Now we are able to say that the life of a Liberty motor is about one hundred flying hours. We have learned that it is perhaps the best airship engine which has ever been made, but it is not the superengine some of its designers hoped for and claimed. In fact, some of them were hopeful enough to say it would never wear out. This, of course, is a mistake. The development of the new mica spark-plug in the place of those formerly made of porcelain cannot be over-estimated.

"Another important and significant fact learned during the race for the first time is that all parts of the Liberty engine are not interchangeable when the parts are made by different factories. We found that some parts on the engines made by the Ford plant and by the Lincoln plant are not interchangeable, as was demonstrated at Presidio Field, California, when the changes were tried. The assertion that any part of any

Liberty engine could be interchanged with any similar part from any other engine, even though made at a different plant, has been one of the most widely advertised features of the new engine."

HAVE YOU HAD YOUR TEETH X-RAYED?

The dental X-ray machine is one of the newest inventions. It is noiseless, yet it is extremely powerful and rapid, and requires a minimum exposure period.

Relative to the technique of taking dental X-ray pictures, it naturally requires a film or plate behind the portion or parts to be X-rayed, but the advantage claimed for the new machine is in the time and milliamperes required for making an exposure.

Exposures on all machines are figures in milliampere seconds. This, being arrived at by the time of exposure, multiplied by the milliamperes. In other words, with a meter reading of 25 milliamperes and an exposure of four seconds it would give an exposure of 100 milliampere seconds. Where other machines operate on anywhere from 50 to 150 milliampere seconds, this machine operates on from 4 to 8 milliampere seconds.

The current is turned on and off by foot treadles operating from both sides of the machine.

As to the patient's safety, the low milliampere-second exposure is the big factor in the machine. According to best X-ray authorities, it takes a minimum of 800 milliampere seconds directed at the same spot to cause a burn. It is readily seen, then, how much leeway the new invention has over a machine using 100 milliampere seconds to an exposure, as compared with the 4 milliampere seconds here required. The lead covering of the tube protects the patient on all parts of the body except just where the rays from the funnel are directed, or in the region of the teeth.

ALFRED T. MARKS.

NOTES.

The Madras publicity Bureau has issued the following :—It is well known that Alizarine dyes were, prior to the war, imported mainly from Germany. In fact, out of 6,469,739 lbs. of Alizarine dyes imported into British India during 1913-14 as much as 4,637,450 lbs. or 73·6 per cent of the total imports came direct from Germany, and 804,243 lbs. (probably of German origin) from Belgium. When war broke out imports from Germany during 1914-15 fell to about half the quantity in 1915-16, and afterwards stopped completely. On the outbreak of the war strenuous attempts were made by the British Alizarine Co. to increase their output but it was not until the *early part of 1918* that they were able to send to India any material quantity of dyestuffs; this quantity was, however, unequal to the demand with the result that the retail dealers took advantage of the situation and made enormous profits. About April 1918, advice was received from the British Alizarine Co. that they were shipping to their Agents *viz*. Messrs. Best & Co. 5 tons of Alizarine and that there was a good prospect of regular supplies being received in future. The Board of Trade, however, required Messrs. Best & Co. to certify in respect of each sale that the dye had been sold to a consumer and not to a dealer. To enable them to do this and to keep down the prices to a proper level Messrs. Best & Co. applied to Government for assistance and co-operation. In May 1918, Government sanctioned the introduction of a scheme by which Collectors of districts were asked to constitute local committees to deal with applications for dyes from bonafide dyers. The committees were to consist of two well known dyers of the locality with a Government official of standing as President of the Committee. The applicant for dyes had to make a formal

application and if it was proved that he was a bonafide dyer he would receive a limited supply at a price fixed by the Collector of the District. In the case of Madura alone which is the chief dyeing centre of the Presidency, an exception had to be made. The system of certificates was tried there for some time but had to be given up owing to certain circumstances special to that place. Since October 1919, the distribution of dyes at Madura has been left in the hands of Messrs. Best & Co. The distibution is being made on the lines laid down by Dr. Marsden and in consultation with the Collector of Madura. The system outlined above worked well on the whole though there were occasional complaints to the effect that persons who were not actual dyers were treated as dyers and that bonafide dyers adopted dubious methods to supplement their allotment. As long as supplies were regular there was not much trouble but with the close of the war and subsequent labour unrest and increase in demand elsewhere there was a fall in the supplies and difficulties have again arisen. According to the terms of the Peace Treaty, Germany has to deliver to the Allies a certain quantity of dyestuffs as part of the reparation for the injuries done to the allies nations. Out of the German dyestuffs allotted to the British Empire, arrangements have been made to secure the whole of the reparation alizarine dyes for India in addition to a portion of the other reparation dyes. These supplies will be in addition to supplies which would, in any case, have been sent to India by the British Alizarine Co. The first consignment of German reparation alizarine dyes for Madras has now been received; it amounts to 200 casks of 4 cwts. each; this consignment and future consignments of alizarine dyes expected from this source will also be distributed in accordance with the scheme referred to in para (2) above. The stock that has arrived has been allocated to the various agencies of Messrs. Best & Co. and intimation sent to the Collectors of the districts. Statements are appended showing the distribution to the agencies and the areas served by each agency. (These are omitted here. Ed., *M. E. J.*) This distribution is proportionate to the demands in the various areas but is admittedly far below the total demands anywhere. This condition of affairs is due to circumstances beyond the control of the Local Government or Messrs. Best & Co. The British Alizarine Co's. new works at Manchester are expected to be completed by June next and shortly afterwards they expect to be able to supply the total Indian requirements from their factories. Meantime the arrangements detailed above will continue to be in force. Any consumer of dyes who wishes to obtain a supply of these dyes should apply to the local committee or to the Collector, if his name is not already on the Committee's list. In conclusion it may be of interest to the public to know that Messrs. Best & Co. are the Madras Agents of the British Alizarine Co., but the former are not at liberty to charge any price they choose. The Government fix the price per lb. and Messrs. Best & Co. have to sell the dyes at that rate: they are allowed a fixed percentage as commission on the net proceeds after deducting duty and handling charges. The sale price of Alizarine has now been fixed at Rs. 1—3—0 per lb. at any of Messrs. Best & Co's. depots.

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The Madras Publicity Bureau in a leaflet says:—A notification has been published in the Fort St. George Gazette under the Madras Agricultural Pests and Diseases Act, 1919, directing that all Cambodia cotton plants in certain taluks in Salem, Trichnopoly and Madura should be pulled out of the ground before the 1st of August in this year in order to eradicate the insect pests pink-boll worm and stem weevil. The circumstances which rendered it necessary to apply the provisions of the Act are as follows:—Cambodia cotton if left in the ground will continue to put forth bolls for a second and

a third year and even a fourth year. Tempted by the high price of cotton many cultivators, especially the more cereless cultivators, have made a practice of leaving Cambodia cotton in the ground expecting to obtain a fair income by harvesting these bolls without the expense and trouble of cultivation. This practice is regrettable in that it fails to secure the fullest use of the land and reduces the area under foodgrains. Further even from the point of view of the ryot seeking an immediate pecuniary profit it threatens rapidly to become ruinous. If cotton stands in the ground for the whole year the pink-boll worm and the stem weevil find a refuge throughout the year and increase and multiply to an incredible extent. In a short time the ravages of these pests becomes so serious that the whole crop is threatened with destruction. The only known method of preventing their multiplication is to see that for a certain number of months of the year there is no cotton on the ground to give them shelter. A single lazy cultivator who decides to leave his cotton standing for a second year in order to save the expense of cultivation may provide a refuge for as many of pests as will suffice to ruin the cotton crops of their more industrious neighbours in half a dozen surrounding villages. It has therefore been considered impossible to leave the annual unrooting of the cotton crop entirely to the will of the individual ryot. Justice to the more industrious cultivator seems to demand that indolent neighbours should be compelled to take the preventions necessary to prevent the spread of these pests. It is for this reason the ryots in Salem, Trichinopoly, Madura and Coimbatore are now to be required to pull up all their Cambodia cotton before the 1st of August yearly. Steps are being taken to make the facts widely known among the villages affected by it.

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Co-operative dairying has been a great success in New Zealand. Dairying now ranks as New Zealand's third industry in order of importance, wool occupying first place and meat second. The value of exports of dairy produce in 1918-19 was £8,250,000 although this figure is considered to be lower than the market value of the commodities concerned, the prices at which cheese and butter were requisitioned by the Imperial Government being below the prices now prevailing in the open market. The dairy factories registered under the Dairy Industry Act include 159 butter factories and 388 cheese factories, as well as 18 butter and 18 cheese factories privately owned; also 29 factories engaged in the packing and preparation of butter for the New Zealand market, but not making it. An idea of the value of the dairying industry may also be obtained from the fact that in the Province of Taranaki land suitable for dairy farming changes hands at £100 to £130, and £135 to £140 per acre; and that £70, £80, £90, and £100 are stated to be common prices for such land in other parts of North Island. Practically all butter and cheese and dried-milk factories are co-operative concerns, owned and directed by dairy farmers—the suppliers of milk. Eggs are usually sold through egg circles or co-operative distributing agencies. As purchasers of manures, machinery, and other requirements, the farmers have greatly increased their activities. They now purchase groceries, furniture, building, and other materials through their own co-operative associations to the exclusion of the merchant and retailer. The Farmers' Co-operative Wholesale Federation (New Zealand), Ltd. (which has offices in London), now embraces eleven associations and 62 branches of associations. To 30th September last the aggregate authorized capital of these united concerns was £3,215,000, of which £2,123,900 was subscribed and £1,490,662 paid up. The volume of business done in the twelve months then ended was £13,900,000; and merchandise sales amounted to £2,500,000. This co-operative

business includes the marketing of wool, stock, and all other farm produce, and the distribution of everything required by the farmer, from a phonograph to a chain-harrow. The business is growing all the time.

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The advisability of introducing small-size agricultural implements for fruit and vine-growers in the East has often been pointed out in these columns, says the *Near East*. Very large fruit farms and gardens and very extensive vineyards in the Near and Middle East are cultivated by hand with a spade of local construction. The special narrow ploughs and diggers which are used in France, and even in this country, for this purpose are unknown there, although the natives throughout the fruit-growing districts of that region would be ready buyers of such implements if they knew them. Why the makers of such implements ignore the very markets in which their products would meet with a great commercial success is inexplicable. Of this we thought again the other day at the recent Implement and Machinery Exhibition at the Agricultural Hall, Islington, when we watched two landowners or merchants from the Levant absorbed for a long time in examining a small fruit-farm plough which was exhibited, and, if we are not mistaken, was subsequently bought by them. The implement was really very interesting: a reversible plough with movable handles and head, either or both of which can be instantly set at any desired angle to allow cultivation to be carried close up to the stems of trees without damaging the branches. There are no projecting parts on the beam, which is specially low down, so that even the branches of bush fruit should be immune from damage when closely ploughed. Moreover, the coulter is attached to the beam in a novel manner, so that no projection appears above the beam. To enable the head to be kept well towards each tree, the draw-bar is taken from the rear of the plough, thus permitting the man and horse to walk in the centre of the alley. The makers may be sure that, if properly introduced, this plough will find a good sale almost throughout the Near East.

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The demand for sheet glass in Japan before the war was about 600,000 boxes (100 square feet each) per year, of which the greater part was imported from Belgium, America ranking second. At that time the Asahi Glass Company was an insignificant native factory; but when the factories in Belgium were destroyed as a result of the war, and the import of American glass also decreased for various reasons, the production of the company practically monopolised the Japanese market, and increased to over 80,000 boxes per year. It was expected that after the conclusion of the Armistice great competition would ensue between native and foreign goods, and that the price would go down as a necessary consequence. As a matter of fact, the market rose instead of dropping. This was due to the following reasons:—(1) That the destroyed factories in Belgium could not be quickly restored, and the cost of production being now much higher than before the war, Belgian goods were not yet in a position to compete with Japanese goods in point of price; (2) that in America, too, the cost of production had risen, and the manufacturers there found it more profitable to export their products to Europe than to Japan, where the high price of their goods made successful competition impracticable; and (3) that the export of glass from Japan to the Far East and Australia increased, as shown in the following table:—

Exports of window glass from Japan in 1919 were:—

		Sq. ft.
January	...	... 2,515,000
February	...	... 2,950,000
March	...	... 2,635,000
April	...	... 2,288,000
May	...	... 3,420,000

June	1,761,000
July	2,075,000
August	1,365,000
Total to August, 1919 ...	19,015,000
Total to August, 1918 ...	15,883,000

In this way the fear of over-production which was entertained as a result of the considerable increase in the production of the Asahi Glass Company was found premature. On the contrary, the export showed a great increase, and stocks at home decreased so as to fall short of the quantity in demand. Hence the rise of the price to yen 30 per box in August. The situation of the market, however, now threatens to undergo a change. Owing to rumour of arrival of foreign goods, in October, the tone of the market became somewhat weak. The merchandise is now in high demand, and Belgian goods, being quoted at yen 26 or yen 27, delivered ex steamer Kobe, are not in a position to effect Japanese goods, the price of which, however, has fallen to yen 28 or yen 29. But a state of competition will be entered on, and the quotation will fall should the Belgian dealers reduce the price. The authorities of the Asahi Glass Company, however, think that they are able to face the impending competition successfully.

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The use of concrete for building purposes, apart from its very extensive use in public works, has recently been increasing throughout the Near East, the few earthquakes last year having probably given a new impetus to concrete building. There is, however, also a certain amount of hesitation owing to defects which are often noticeable in such constructions, and which are attributed to reasons more or less baseless. The most probable reason, however, in such cases is the bad handling of the concrete through inadequate supervision over inefficient men who are entrusted with the mixing. It is admitted that the mixing of concrete is one of those things which can be done very easily indeed, but requires a very great deal of care if it is to be done really well. Men who handle concrete habitually are aware of the importance of grading aggregate, sand and cement in such proportions as to give as solid a concrete as possible; and of mixing the components together thoroughly. Professor Abrams, of the Lewis Institute, drew attention to a point which perhaps has not received due consideration, and that is the importance of using the minimum amount of water sufficient to produce a plastic or workable concrete. In fact, he considers that the water proportion has more effect on the nature of the resulting concrete than the proportioning of the other ingredients. His conclusions are based upon some 50,000 tests, and therefore deserve the most serious consideration. Two of them are that the use of a pint more water than is necessary in a one-bag batch reduces the strength as much as would the omission of 2 lb. to 3 lb. of cement; and that the mere use of richer mixtures, while encouraging a feeling of greater security, in many cases causes nothing more than waste of cement because the water is in excess.

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Much attention has been given in recent years to the question of manufacturing alcohol within the Empire for use as motor spirit. In the current number of the *Bulletin of the Imperial Institute* the possibility of utilising the mowra flowers of India for the purpose is discussed. These flowers possess thick, juicy petals, rich in sugar. They are used by the natives as a foodstuff and especially for the preparation by fermentation of an alcoholic liquor called daru or mohwa spirit. A single tree will yield as much as 200-300 lb. of flowers in a year. The tree also produces a valuable oil-seed, which is exported in fairly large quantities to Europe. During the war the flowers were used in India for the production of acetone, the yield being said to be ten times as much as that obtained by distilling wood, which is

The first part of an interesting article on the Agriculture of Cyprus, by Mr. W. Bevan, Director of Agriculture in the Island, appears in the current issue of the *Bulletin of the Imperial Institute*. The subjects dealt with include Live Stock, Dairy Produce, Cereals, Fruits, Nuts and Vegetables. The Messaoria plain is the great corn-growing area and in ancient times the island produced sufficient wheat to supply all the needs of its population which then numbered over a million, the annual production amounting to about 10,000,000 bushels. At the present time, with a population of a little over a quarter of a million, only about 2,000,000 bushels of wheat are being produced, but the yield could be greatly increased by better methods of husbandry, by the use of improved implements for cultivating and reaping and by the use of threshing machines. The methods practised have changed little for ages. The old wooden plough is still used, whilst the threshing floors are practically identical with those of Biblical times, consisting merely of a levelled piece of ground, sometimes paved with flagstones. A stout board, studded on the undersides with sharp flint stones (the tribulum of Virgil), is drawn over the spread-out sheaves by mules, donkeys or oxen. Large quantities of barley are grown, the production in 1918 amounting to over 3,000,000 bushels. Most of this is used locally for feeding cattle, but some is exported to England for malting purposes. The cultivation of the grape-vine and the making of wines are important industries and the celebrated Commandaria wine, which acquired great fame in the time of the Knights Templars, is still being produced and exported in limited quantities.

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According to the "Vaderland," a new system of wireless aerials has been experimented with at Scheveingen, which is the invention of a Dutchman of the name of Vlug. In fact, the word "aerial" is no longer applicable, as the wires for a length of from 100 to 150 metres are lightly buried in the ground. They are said to be highly sensitive, with the result that two wires are sufficient for direct communication with Bandoeng (Dutch East Indies), the receiver being placed between the two, which contains certain improvements of Mr. Vlug's invention. Comparison has been made between this wiring and the large antennas at Scheveningen, by which it was proved that signals were louder on being received through ordinary aerials, but that not a letter was distinguishable owing to the disturbances. These had not entirely disappeared when employing the Vlug system, but had gained greatly in distinctness, so that not a letter was missed. One lamp was used as a dector and another as a low frequency amplifier. The report goes on to say that the period of the year is especially suited to receive the Bandoeng messages, and also that, although great difficulties are experienced owing to disturbances caused by the large European stations, the Telephunken station at Sambeek contains an improver by which Bandoeng will always be easily detected, but it remains open to question whether it will be practicable for ordinary operators. On the other hand, an instrument constructed by Dr. Koomans, an engineer attached to the Telegraph Service, does not present such difficulties.

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The Economic Botanist to the Government of the Punjab at Lyallpur, in the course of his account of experiments in Economic Botany for the year ending 30th June, 1919, says:—It is now clear that Arabian dates of a very much better quality than the local dates can be grown in the date growing tracts of the Punjab. The best Punjab Arabian fruits, cured and packed in cardboard boxes for dessert purposes are eagerly sought after at Re. 0-8-0 per pound and we could sell large quantities of uncured fruits fresh from the trees, wholesale in the local

bazar at Re. 0-2-0 per pound. This is about equal to Re. 0-4-0 per pound for cured and packed fruits. The great mass of the loca dates do not fetch more than Re. 0-0-6 per pound. Our work shows that dates could be grown practically all over the plains of the Punjab were it not for the rains in the fruit ripening time rotting the fruits. As the fruits grow in large bunches we hope to overcome this difficulty by bagging them in waterproof bags. We are experimenting on this point. The most serious disease to which the date palm is subject here is red-weevil. (*Rhynchophorus ferrugineus Olive*). It bores into the tree trunks and kills them. We have dealt successfully with attacks of these weevils on our young trees and we are experimenting with methods of dealing with adult trees. We have a large number of requests for suckers from local date-growers and we are now starting a date farm of 18 acres at Muzaffargarh. An assistant has been placed there recently. The war has prevented us from getting young trees from Mesopotamia for some years, but we hope to get some soon now. The book on the Date Palm and its Cultivation in the Punjab which we have brought out seems to have met a felt want.

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The Department of Overseas Trade is organizing an Exhibition of Timbers grown within the British Empire, to take place at the Holland Park Skating Rink, London, from 5th July to 17th July, 1920. The main object of the Exhibition is to bring prominently before architects, inspectors, firms who have to specify timbers in their contracts, as well as the users and consumers of timbers the full range of Imperial grown timbers, and especially those timbers which up to the present are only very slightly, if at all, known in this country. At the same time the Exhibition will demonstrate the chief uses for which such timbers are suitable.

The classification embraces—

(a) Specimens of timber;

(b) Exhibits demonstrating the various uses to which timbers are put, *viz.*, floors, panelling, staircases, furniture, ply wood, and articles of everyday use;

(c) Wood pulp.

A Committee has been formed to arrange all details connected with the Exhibition, and includes representative of—

Colonial Office,
Crown Agents for the Colonies,
Government of India,
Self-Governing Dominions,
Forestry Commission,
British Societies interested in the production and utilization of timber.

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The use of electricity for assisting and improving the growth of plants has passed the experimental stage, and in many large farms, and even in small holdings, it is now employed with complete success. It has been proved that the action of an electric current passing through the soil is very stimulating. The method usually adopted is a network of galvanised iron wires stretched over the field to be treated, and suspended 15 to 18 ft. from the ground from insulators attached to wooden posts placed about sixty yards apart. These posts are in parallel rows, about 100 yards apart. The electrification of the network is accomplished by the use of a very little current at an extremely high voltage. The network is charged positively. The power which is required per acre is quite small. It is calculated that for an expenditure of twenty units per annum per acre the electrical discharge may take place for eight or ten hours a day; and if the cost per unit is no more than 3d. the price per acre amounts to about 5s. per annum. By this electrical treatment the yield per acre is increased 30 per cent., and even more under certain conditions. The beneficial

effect of electricity on plants is not a new discovery, for it was noticed some years ago that the growth of plants was assisted by the electrification of the atmosphere. In the South of Italy the above described method, with slight modifications, has recently been adopted to assist the growth of Macedonian (Yenitze) tobacco.

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The Government of Madras has issued the following notification in the home (Education) Department. Representations have been made to Government by teachers in aided schools throughout the Presidency both individually and through their associations that the scale of pay which is sanctioned by the managers of schools is not sufficient to meet the increased cost of living due to the changed economic conditions in India. The question has also been brought up for discussion in the Legislative Council. Government have in consequence decided that a sum of money not exceeding Rs. one lakh be allotted for distribution to managers of schools with the ebject of enabling them to increase the pay of their teachers. The Director of Public Instruction has begun his investigations and will submit proposals to Government for the distribution of additional aid with the object of carrying out the intention of Government as stated at the meeting of the Legislative Council held on the 5th February 1920. The Government will not, however, be prepared to give aid over and above the normal provision of the Grant-in-Aid Code unless they are convinced that local effort has done as much as it can in this regard, and that the management of a school has itself no means of increasing the sum available for the maintenance of the school.

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The Chilean "Revista Economica" calls attention to the considerable progress of the sugar industry in Panama, many enterprises for the cultivation and manufacture of sugar on a large scale having recently been established in different parts of the Republic. Amongst these concerns figure the Socieded Azucarera de Chitre, established at that town with a capital of 30,000 balboas, which has just commenced the exploitation of the sugar-cane industry in the Province of Herrera. The Panama Sugar Company operates in the district of Chiriqui Viejo, and owns 11,456 hectares of land, of which 600 hectares are sown with cane. A company has recently been organized by Messrs. Chiari and Gamarra for the erection of a sugar mill and factory in the district of Aguadulce; where they already have 120 hectares sown with cane and have commenced the sowing of a further 200 hectares. This last enterprise has just received from the United States machinery capable of crushing 240 metric tons of cane per 24 hours, representing a production of over 26 metric tons of sugar in the same time. The Panama Sugar Company, it is stated, has invested 800,000 dollars in this company.

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The Report on the Administration of Coorg for the year 1918-19 says:—The receipts from the sale of sandalwood were again extraordinarily good, and the Forest Department realized a net surplus of Rs. 2,58,351. Very considerable progress was made in the construction of the Forest Tramway in the Western Ghats. It is hoped to finish this work in the present year. The extraction of the magnificent timber from these virgin forests will, in all probability, increase the revenue of the department many times over. Proposals were also made for the construction of a tramway in the eastern forests. In addition, sylvicultural operations were continued with vigour throughout the province. Sandalwood, in special, is receiving close attention both as regards its regeneration and its growth. Mr. Hart, the Inspector-General of Forests, visited the province in December and January and inspected a large proportion of the works in progress. The exploitation of the Coorg

forests is a matter of the greatest importance to the province. Considerable additions to the existing staff, both superior and inferior are urgently required and partial proposals were submitted during the year and are now under consideration.

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It is to be hoped says the *Times*, that the movement, which is now gaining impetus, for the encouragement of cotton-growiug in the Empire will be followed by a similar effort to reduce our dependence on foreign supplies of sugar. As is well known, there is a world shortage of sugar, last year's crop being estimated at fully 2,300,000 tons less than the crop of 1913-14. The European beet sugar crop, which before the war amounted to nearly half the world's output, has sunk to well under a quarter of the total, and only about half the deficieucy has been made good by increased supplies of sugar from other parts of the world. Statistics prepared by the West India Committee give the annual sugar crop of the Empire, exclusive of India, before the war as rather under 900,000 tons, and it is estimated that five times this amount could be produced. There can be no question as to the advisability of retaining the £25,000,000 to £30,000,000 spent annually on sugar within the Empire, and a strong movement to achieve this object is badly needed, particularly in view of the real danger that some of the existing sugar lands may be diverted to other crops, such as cotton.

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The Advisory Council of the Committee of the Privy Council for Scientific and Industrial Research have published a Memorandum on Solid Lubricants which has been prepared by their Lubricants and Lubrication Committee. This Committee was appointed in July 1917, to survey the field for research on Lubricants and Lubrication, and in the course of their work dealt with the question of Solid Lubricants. The Memorandum embodies existing knowledge on the subject but the Advisory Council desire that the Bulletin should be regarded rather as a summary of existing literature than as an authoritative statement based upon actual research work. The subject is dealt with under the following main headings: (1) Characteristics of Solid Lubricants. (2) Action of Solid Lubricants. (3) Analyses of Lubricating Graphites. (4) The Grading of Graphite. (5) Hot Bearings. (6) Methods of Applying Solid Lubricants. (7) Drawbacks to the use of Colloidal Solid Lubricants. (8) Observations on Results obtained by the use of Solid Lubricants. The Bulletin is published by H. M. Stationery Office and may be purchased through any bookseller, or directly, price 6*d*. net, from H. M. Stationery Office.

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On April 19th, 1917, a paper by Mr. R. S. Pearson, F.L.S., on "The Recent Industrial and Economic Development of Indian Forest Products" was read before the Indian Section of the Society. Sir Robert W. Carlyle, late Revenue and Agricultural Member of the Government of India, who presided on the occasion, referred to the possibility of every great development, with a sufficiently adequate staff, more roads, and the best mechanical means of extracting the timber. In view of these problems the Government of India has recently decided to create a Forest Engineering Service, paid on the same scale as the Imperial Forest Service. It is proposed that the recruits to the new service should be trained in Canada and the United States, where, it is pointed out, the subject of timber extraction and utilization has long been studied, and improved methods bave been introduced under conditions approximating those encountered in many parts of India and Burma.

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Much attention has been given in recent years to the question of manufacturing alcohol within the Empire for use as motor

spirit. In the current number of the *Bulletin of the Imperial Institute* the possibility of utilising the mowra flowers of India for the purpose is discussed. These flowers possess thick, juicy petals, rich in sugar. They are used by the natives as a foodstuff and especially for the preparation by fermentation of an alcoholic liquor called daru or mohwa spirit. A single tree will yield as much as 200-300 lb. of flowers in a year. The tree also produces a valuable oil-seed, which is exported in fairly large quantities to Europe. During the war the flowers were used in India for the production of acetone, the yield being said to be ten times as much as that obtained by distilling wood, which is the usual source of this substance. The demand for acetone in India in peace times, however, is not great, and large quantities of the flowers would be available for the manufacture of alcohol, and would appear to be an exceptionally cheap source of this material as the yield is high compared with that from potatoes and other materials commonly used, about 90 gallons of 65 per cent alcohol being obtainable from one ton of dried flowers. It has been estimated that in the Hyderabad State alone there are already sufficient mowra trees for the production of 700,000 gallons of proof spirit per annum, in addition to that necessary for the local liquor requirements. It is suggested that the most profitable way of utilising the flowers would probably be as a source of mixed motor spirit of the "natalite" type for use in India. That motor spirit can be produced on a manufacturing scale in India from mowra flowers has already been demonstrated and it is stated that running trials with the spirit proved satisfactory.

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An article in the *Board of Trade Journal*, February 5th, points out that while there are many gaps in the range of dyes now being produced by British makers, the position is distinctly hopeful, and that there is every ground for the belief that the main difficulties inherent in the creation of so complicated an industry as the coal-tar chemical industry have been successfully surmounted. It took the Germans forty years to reach their present position, and it cannot be expected that we can attain the same position, even with the valuable stimulus of a five year war period, in much less than ten to fifteen years. Hence the proposal for the temporary protection of the industry for a limited period. The present output of dyes in this country is not less than 25,000 tons per annum.

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A Press Communique of the Government of India Department of Commerce dated Simla, the 10th April says:—The question of the location of an aerodrome for Calcutta has been engaging the attention of the Government of India for some time past. A site in the vicinity of the Ammunition Factory at Dum Dum was suggested by the Officer Commanding, Royal Air Force in India, but as it was open to various objections efforts were made to find a more suitable site elsewhere. These attempts have, however, been unsuccessful, and the Government of India have now accepted the recommendation of the Air Board that the Calcutta aerodrome should be located at Dum Dum, and it is hoped that the preparation of the site will be completed before the arrival of the monsoon.

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We are in receipt of a copy of *An Evening at the World Trade Club.* The booklet gives an account of the meeting held on the evening of 18 June, 1919, at which one of San Francisco's leading commercial organizations discussed a vital issue of the day—the question of world standardization of weights and measures. The club resolved to respectfully urge that the units of the Metric System be adopted by the Congress of the United States of America and the British Parliament as the exclusive legal standards of weights and measures. The metric system is simple, logical, and easy to use, because it is a decimal system with only three units—meter, liter, gram. It is earnestly hoped that every one will give this standardization his hearty support.

The 9th meeting of the Education Section of the Board of Industries was held at Cawnpore on the 15th March. Amongst the matters disposed of were applications for grant-in-aid applied for by the Y. M. C. A. Commercial School, Allahabad, and London Mission Girls' School, Almora. Codes of Regulations of the Technical School, Jhanasi, and the Carpentry and Smithy classes opened recently at the Central Weaving Institute, Benares, and a scheme for the transfer of the Electrical and Mechanical classes from the Thomason College, Rurki, to the Technical School, Lucknow, were also framed. A scheme for the expansion of scholarships in several of the Technical Schools were also considered and recommended to Government.

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We have been favoured with a copy of *Millard's Review of the Far East*, for Jan. 17th. The *Journal* is devoted to Far Eastern Topics of current interest and is published by the Millard Publishing Co., Inc. 113, Avenue Edward VII, Shanghai, China. In the number for January 17th, there is an interesting article on Sir John Jordan, British Minister in China, who is retiring from his post after 43 years of service. The article takes the form of a biographical memoir of Sir John Jordan. The writer, apparently a Chinaman himself, adduces many reasons to show why his countrymen love Sir John and winds up by saying that he has been as Confucius would say, a truly strightforward friend.

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A new use for the vast quantities of waste material produced in quarrying slate has, according to the *Chemical Trade Journal*, been developed in Carnarvonshire, where a Company is powdering the waste and selling it as a filling material. It is said to be useful in a manufacture of asphalt, bricks, cement, abrasive soaps, cleansers, glass, linoleum, moulded and mechanical rubber goods, pottery, slabs and tiles, distempers, paints, insulators, etc. It produces bricks which are at the same time dense, strong, and hard, and which show a considerable saving in manufacturing costs. The silica content ensures that they are capable of withstanding a very high temperature.

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The amount of cotton seed received at the mills in the United States from 1st August to the end of 1919 was 2,868,795 tons, as compared with 3,220,512 tons during the same months in the preceding year. Statistics compiled by the Bureau of the Census show that during these five months in 1919, 23,57,402 tons of seed were crushed, as compared with 21,22,825 tons in the same period in 1918, and the quantities on hand in the mills at the end of the year were 535,118 tons, and 1,138,125 tons in 1919 and 1918 respectively. Exports during the period mentioned in 1919 amounted to 13,539,702 pounds, and for 1918 to 4,904,014 pounds.

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Such articles as pearl buttons, combs, brushes, etc., previously obtained by Switzerland from Germany, are now being imported from Japan. One firm alone imports Japanese pearl buttons to the value of about 4,000,000 francs. The shipments are usually directed *via* Marseilles and lately *via* Antwerp. The banking arrangements are made through the Yokohama Specie Bank, or the Hongkong Banking Co-operation of Lyons. A well-known Swiss trader desires therefore to call the attention of British manufacturers of pearl buttons, combs, brushes, etc., to the substantial market which is open to their goods in Switzerland.

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American manufacturers of motion picture films are considerably interested in the results of experiments conducted by the Celluloid Company of New York, which claims to have perfected a synthetic substitute to take the place of camphor in the manufacture of motion picture films. The substitute, it is stated, will eliminate much of the inflammable nature of the film. It is believed that the manufacture of this material in commercial quantities will eventually make American producers independent of the Japanese camphor monopoly, which has cut its allotment to the United States for the year 1920.

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It appears from an answer given to a question in Parliament that the sales of the Home-grown Timber Department last year approximated in value to £3,700,000. The Department, it was mentioned, is being wound up as rapidly as possible. There are still about 6,500 workpeople—sawyers, fellers, etc.—on its pay roll.

GLEANINGS.

The authorised capital of companies organized during 1919 in the United States of America for the manufacture and distribution of Chemicals, drugs, and dyes, amounted to 112,173,000 dols., as compared with 73,403, dols. in 1918, and 146,160,000 dols. in 1917. Since the outbreak of the war these industries have expanded greatly, as is indicated by the formation from 1st August, 1914, to the end of 1919, of companies involving an aggregate capital of over 500,000,000 dols. The development year by year since the beginning of the war is shown in the following table:—

		Dols.
Five months, 1914	...	16,838,000
Year, 1915 ...	...	65,565,000
Year, 1916 ...	...	99,244,000
Year, 1917 ...	...	146,160,000
Year, 1918 ...	...	73,403,000
Year, 1919 ...	...	112,173,000
Total	...	513,383,000

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A movement to establish a National Laboratory Foundation for Invention and Research is on foot in the United States of America. It is proposed that the Foundation should be established by independent endowments of wealthy men and large industrial firms, and should then become self-supporting by a percentage arrangement on the inventors which the laboratory will help to develop and market, giving financial aid to the poor inventor. Plans for the establishment of the Foundation have been going on for two years under the direction of Mr. Thomas Howard, Executive Chairman of the National Institute of Inventors, which has a membership of nearly 3,000.

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The cost of living in the United States has advanced a fraction more than 80 per cent since July, 1914, according to a statement issued by the American National Industrial Conference Board. The figures, it was announced, are based on the study of family budgets reported by the United States Bureau of Labour Statistics, supplemented by reports of clothing and food dealers, civic organizations, real estate agents and public utility corporations. Clothing has increased most in price since July, 1914, the percentage being 135. Food comes next with an advance of 92 per cent; fuel, heat and light next with 48 per cent and rent 38 per cent. Food advanced only one per cent in price during the five months, August-December, 1919, while clothing prices again led the van with an increase of 15 per cent. Items listed generally as sundries advanced 75 per cent during the five year period, and 7 per cent since last July. Sundries include car fare, candy and soda, amusements, insurance and household furnishings. Picture theatre charges advanced more than 100 per cent and also the cost of furnishing a house.

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The so-called rare sugars are used to a considerable extent by the Army Medical Corps and by the medical profession in general. One of the principal uses to which they are put is the differentiation of bacteria, for which purpose they are invaluable. For some time the United States Bureau of Standards has had presented to it for test a number of these rare sugars. Owing to the large demand for one of these sugars, known as d-Mannite, the Bureau undertook, at the request of the United States War Department, the production of a considerable quantity of this substance. The source of supply is a crude manna. The Bureau's investigations finally developed a method whereby pure white crystals of d-Mannite can be produced by two crystallisations from the crude manna. It has thus become possible to produce relatively large quantities of this valuable substance at a reasonable cost.

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An "Empire Timber Exhibition" will be held at the Holland Park Skating Rink from

July 5th to July 17th. It is being organized by the Department of Overseas Trade with the primary object of bringing prominently before architects, inspectors, and firms required to specify timbers in their contracts, as well as before users and consumers, the full range of Imperial grown timbers, and especially those kinds which up to the present are only slightly, if at all, known in this country. It is also desired at the same time to demonstrate the chief uses for which such timbers are suitable. Almost all the self-governing Dominions, Crown Colonies, and Protectorates have definitely decided to participate. A limited amount of space will be available for the use of traders in this country in which to display specimens of articles manufactured from timbers grown within the British Empire.

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Roof timbers in buildings where high humidity is the rule have been a source of trouble to operators of paper and cotton mills and other industries, because of their tendency to decay rapidly. In order to determine the best means of preserving such timbers, the Forest Products Laboratory at Madison, Wis., has conducted a series of tests of the various treatments. As a result, it was recently announced that the pressure method, with either creosote or a zinc chloride solution, will give better results than steeping, dipping or painting. Twenty years may be added to the life of the wood by this treatment, it is declared, though it is admitted to be the most expensive. Each cubic feet of timber should receive 8 to 12 pounds of zinc chloride, if the latter is used.

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A statement has appeared in the Boston press to the effect that long staple cotton has been grown for the first time in the southern plains region of West Texas. Cotton experts had believed that the high altitude would militate against the successful production of this commodity, but a farmer in the region has planted a small acreage with a yield of five bales, the first bale of which he sold at 62 cents a lb. It is stated that the crop did exceedingly well from the beginning, and that the yield was as heavy as the ordinary short staple, no special irrigation being required to produce this result. It is expected that in view of this initial success the acreage of long staple cotton will rapidly increase.

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About 160 Chinese students in Chungking (China) are now taking a preparatory course in French in the hope that they will be able to proceed to France next autumn to pursue higher industrial education in French colleges. A special school has been started for them, and many of them have been granted free tuition and will be advanced the money for their journey.

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In making the frames and wings of aeroplanes and airships in Italy, preference is given to Ashwood because its fibres are fine, compact, strong and with few knots. Ash grows well in the South and centre of Italy, in loose, slightly moist, or even dry soils. Its trunk is straight and exceeds 65 feet in hight.

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The first Class Silkworm Feeding and the High Primary Schools in Taikang (Honan, China) have raised a sum of about $80 for organizing peddlers groups to sell Chinese National products.

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The Government of Hayti have granted a concession to the Anglo-Haytian Sugar Company for the erection of a Sugar Central and other enterprises in Hayti.

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Instructions have been issued by the Industrial Bureau (Honan, China) to all the districts, to organize the Industrial Promotion offices.

ECONOMIC NOTES.

INDUSTRIES AND COMMERCE.

IMPERIAL PREFERENCE.

Report of Council Committee.

The report of the committee on the subject of Imperial Preference has been published on April 19, together with a brief resolution which stated that the recommendations made by the committee were receiving the careful consideration of the Government of India and their decision would be notified as soon as possible. The following is the report:—

In accordance with our terms of reference we have examined the trade statistics of imports into and exports from India. Statistics have also been laid before us relating to the imports into the United Kingdom and other principal ports of the British Empire of certain articles which India produces or which there is a likelihood of her roducing in the near future. We attach to this report a copy of a memorandum which has been laid before us and statements showing the value and the duty as at present levied on the imports of these articles into the United Kingdom and the principal dominions in the years 1912 and 1918. We first considered the question whether the application to the Indian customs tariff of a system of preference in favour of goods of Empire origin would be likely to involve any danger of retaliation by countries outside the Empire in respect of our export trade. So far as we are able to judge we are unanimously of opinion that in view of the demand for our raw materials there is no danger to be feared on this score and that the apprehensions of Lord Curzon's Government in respect of this particular aspect of the question would in the present circumstances be unreal.

Having disposed of this aspect of the question we considered in what directions loss and in what directions gain would be likely to result from the adoption of a system of preference in our import tariff. It seemed to us probable that we are to secure from our customs duties the financial resources which we require. The adoption of a system of Imperial Preference would entail the raising of the present import duties against foreign nations. This would presumably result in raising to some extent the prices of imported commodities to the consumer in India and from this aspect would be likely to be injurious. Looking to the profit to trade, the number of commodities in our export trade which might be expected to benefit by an increased market within the empire appeared to us to be limited. Our general conclusion is that India is neither likely to gain nor to lose appreciably on the balance by the adoption of a moderate preference in our import duties. Though these are our provisional conclusions we feel that we are not able to give an authoritative opinion on the subject and we consider that such an opinion can be obtained through the recommendation which we make below. By our terms of reference we were asked to report as to the best method of considering the future fiscal policy of India. We think that this can only be effectively enquired into by means of a commission with power to take evidence in various parts of the country from all the interests concerned, from importers and exporters, producers and manufacturers, and from persons entitled to speak on behalf of consumers. In the connection we think it right to draw attention to the fact that the fiscal questions were specifically excluded from the purview of the Indian Industrial Committee and it seems to us desirable that the enquiries of the commission should be followed by the appointment as early as convenient of an equally strong and representative commission to examine the whole question of the future fiscal policy of India.

D. E. Wacha,
A. H. Ley.
Sita Nath Roy.
Fazulbhoy Currimbhoy.
G. M. Chitnavis.
B. N. Sarma.
G. S. Barnes.
Claude H. Hill.
R. A. Mant.
Zulfiqar Ali Khan.
W. E. Crum,
Nigel F. Paton.

I agree but I would substitute for the words in the present circumstances, in the last line of paragraph 2 the words, 'so long as existing conditions continue' to make my meaning clear.

B. N. SARMA.

UNITED STATES SUGAR TRADE IN 1919.

It is stated by the United States Sugar Equalisation Board that of the shipments to Britain in the fiscal year ending 30th June, 1919, totalled 1,124 million lb., 870 million lb. were for the account of the British Royal Commission on Sugar Supply in the allied countries of Europe.

This refined sugar was the product of 930 million lb. of raw sugar purchased by the Royal Commission from Cuba, imported into the United States for the purpose of refining, and then exported to the United Kingdom, France, Italy, or foreign possessions of these countries. This amount of sugar, therefore, although included in the import and export statistics of the United States, is different from ordinary exports because, being of British ownership, it is not taken out of supplies that otherwise would go into domestic consumption, and represents no deduction from stocks of sugar in the United States.

TRADE INTERESTS.

A memorandum prepared by the Statistical Division of the United States Bureau of Foreign and Domestic Commerce states that the American receipts of cane sugar from foreign countries and from non-contiguous territories during 1919 have broken all previous records. During the ten months ending with October the total receipts amounted to 8,237,453,522 lb., valued at 481,424,107 dols., which is 1,759,988,484 lb. more than for the corresponding period in 1918, and represents an increase of 27·2 per cent in one year. Shipments during the first ten months of 1919 amounted to 1,258,168,072 lb., valued at 96,982,888 dols., against 286,251,092 lb., with a value of 18,930,821 dols. in 1918, an increase of 339·5 per cent in quantity and 412·3 per cent in value.

The receipts of sugar for the ten months ending October comprise 6,392,138,811 lb., valued at 355,725,617 dols., imported from foreign countries, 1,103,555,180 lb. of raw sugar, valued at 71,998,124 dols., and 23,902,500 lb. of refined sugar, valued at 51,549,116 dols., from Porto Rico. Domestic exports of 1,246,869,413 lb., valued at 96,033,653 dols., shipments of 6,584,765 lb., valued at 618,031 dols., to non-contiguous territories, and re-exports of 4,713,894 lb. of foreign sugar, valued at 331,204 dols., make up the total of 1,258,168,072 lb. of sugar, valued at 96,982,888 dols., shipped in January-October.

Presented in tabular form the total cargoes of sugar inward and outward during the first ten months of the last three calendar years were :—

January-October	Receipts		Shipments	
	lb.	dols.	lb.	dols.
1917	6,907,266,260	334,531,578	976,484,508	62,189,394
1918	6,477,465,038	322,742,886	286,251,092	18,930,821
1919	8,237,453,522	481,424,107	1,258,168,072	96,982,888

SOURCES OF THE SUGAR PURCHASED.

More than 6,000 million lb. of the sugar received from foreign countries was supplied by Cuba. The Philippine Islands rank second with 175,432,529 lb Imports from the Virgin Islands and the Dutch East Indies show marked increases over the two years preceding. In direct contrast there is a decrease from 91,833,829 lb. in 1917 to 73,700 lb. in 1919 in the imports of sugar from the Dominican Republic, and from 29,525,000 lb. in 1917 to 1,123 lb. in 1919 in those from Japan. The receipts by countries of origin for the ten months ending with October of the last three years are shown in the following table :—

Received from	Fiscal years ending 30th June		
	1914	1918	1919
	lb.	lb.	lb.
Central America...	40,202,480	166,292,751	158,343,135
Mexico	49,385,504	31,118,515	21,963,490
West Indies :—			
Haiti	2,124,432	25,849,779	47,949,384
Other	2,586,837	4,391,138	9,074,645
Brazil	743,113,500	743,958,456	571,921,575
Colombia	91,830,513	112,159,390	121,416,448
Venezuela	49,953,478	50,122,484	85,007,646
Other South America	2,113,506	4,392,895	4,252,158
Aden	2,271,202	...	762,594
Dutch East Indies	8,421,592	4,687,538	13,583,965
Japan	...	...	7,859,567
Turkey in Asia	1,838,128	...	5,440
Other countries	7,669,756	758,236	3,800,225
Total from foreign countries ...	1,001,510,928	1,143,731,180	1,045,940,235
Hawaii	4,430,722	1,968,080	5,623,145
Porto Rico	420,644	256,697	276,529
Total from non-contiguous territories ...	4,851,366	2,224,777	5,899,674
Grand Total, quantity ...	1,006,362,294	1,145,955,957	1,051,839,910
	dols.	dols.	dols.
Grand Total value ...	111,454,240	103,355,279	144,069,369

Imports of beet sugar for the first ten months of 1919 were 1,180 lb., valued at 108 dols., and of maple sugar, 3,593,221 lb., valued af 1,011,228 dols.

DESTINATION OF THE SUGAR SHIPPED.

The export and re-exports of refined sugar for the ten months ending with October, 1917 to 1919, are given in the following table by countries of destination :—

Shipped to—	10 months ending October		
	1917	1918	1919
	lb.	lb.	lb.
Austria-Hungary	...	...	2,021,429
Belgium	17,362,379	25,416,000	16,485,998
Denmark	3,091,386	...	9,841,526
Finland	...	...	11,205,648
France	323,494,438	127,253,009	529,075,554
Gibraltar	560,000	...	76,235,000
Greece	906,295	1,000	32,103,027
Iceland	5,532,427	22,400	2,616,455
Italy	28,067,011	19,671,159	58,931,136
Netherlands	6,085,360	...	1,438,441
Norway	76,408,172	10,090,012	13,623,850
Spain...	57,260,091	...	55,917,608
Switzerland	21,503,960	28,100	2,240,747
Turkey in Europe	...	...	27,490,780
United Kingdom...	118,837,498	14,506,261	326,095,676
Canada	643,370	47,415,994	443,953
Mexico	38,901,207	2,434,024	25,035,338
Argentina	143,408,561	60	546,200
Chile	2,008,735	20,305	470,875
Paraguay	...	...	2,350,000
Uruguay	46,400,392	22,400	29,334,200
Japan...	472,097	150	297,155
Turkey in Asia	...	...	1,446,400
Philippine Islands	254,040	12,360	3,064,656
British Africa	3,428,580	965,167	1,401,826
French Africa	661,071	386,571	3,419,167
Morocco	67,000	13,084,500	616,000
Other countries	54,131,912	16,161,653	13,120,768
Total to foreign countries ...	948,487,982	277,491,125	1,246,869,413
Alaska	7,085,135	7,542,602	4,882,279
Hawaii	1,485,200	127,168	896,958
Porto Rico	5,474,582	185,404	805,528
Total to non-contiguous territories ...	14,044,917	7,855,174	6,584,765
Re-exports of foreign sugar ...	13,951,609	904,793	4,713,894
Grand total ...	976,484,508	286,251,092	1,258,168,072

These exports include not only sugar that is grown in continental United States and the non-contiguous American territories, but also all raw sugar received from foreign countries and refined in the United States, such sugar being then regarded as domestic. The re-exports consist of foreign sugar that was re-shipped in the form in which it was first received.

YEAR'S BEST CUSTOMERS—AVERAGE PRICES.

Europe took more than 90 per cent of the total exports, France and the United Kingdom being the largest individual purchasers. Remarkable gains are shown in the exports to Finland, Gibraltar, Greece, and Turkey, while shipments to Norway and Switzerland declined. Exports to South America show a large decrease in the last two years. Argentina having received only one-half million lb. in 1919, against 143 million lb. in 1917.

The price of the sugar imported from foreign countries during January-October, 1919, averaged 5·6 cents a lb., against 4·7 cents in the like period of 1918, and 4·5 cents in 1917. The average price of the sugar received from Hawaii was 6·5 cents, and from Porto Rice 7·2 cents. The average price of the sugar shipped was 7·7 cents a lb· in 1919, 6·6 cents in 1918, and 6·4 cents in 1917.

THE SEED-CRUSHING INDUSTRY,

Development During the War.

Before the Royal Society of Arts on December 3, Mr. J. W. Pearson, chairman and managing director of the British Oil and Cake Mills, Ltd., read an interesting paper on "The Seed-Crushing Industry." Lord Lamington presided at the meeting.

The seed-crushing trade, Mr. Pearson said, was probably one of the oldest industries in the world, and yet, like many another whose importance had not always been fully realised from a national point of view, it was left for the outbreak of the most devastating war in history to bring about a recognition of its vital importance. At the time of the outbreak of war there were some sixty different firms engaged in the trade in Great Britain ranging in importance from small country owners with a mill capacity of 5,000 tons of seed per annum to the establishments of the British Oil and Cake Mills, Ltd., whose combined branches handled something like 45 per cent of the entire industry. The importance of ensuring that oilseed factories should be kept fully at work during the war was quickly recognized, but, curiously enough, it was in the first place at the instance of firms engaged in the soap trade, who pointed out that the supply of glycerine for the manufacture of explosives was dependent upon the maintenance of adequate supplies of oils for soap manufacture. It was therefore considered necessary to include the trade of seed-crushing in the group of "controlled industries" under the Ministry of Munitions. Later on, the other aspect of the trade became more dominent, and the importance of the mills as a source of food supply—firstly, for the production of edible oils required for the manufacture of margarine, and secondly for the cakes so necessary to the production of meat and milk—resulted in the transfer of control from the Ministry of Munitions to the Ministry of Food. While during the days of its early growth this trade was mostly centred at the principal shipping ports, Hull, London, and Liverpool, there had been a gradual extention of factories at the outports.

BRITISH EMPIRE'S OILSEED CROP.

The major portion of the oilseed crops of the world were produced within the British Empire, and it was interesting to note that while a few seeds, notably linseed, rapeseed, and sunflowerseed, were grown in the Temperate Zone, the remainder were grown almost exclusively in the Torrid Zone, and, therefore, had to be imported by Europe for consumption there. England grew no oilseed crops, and was, therefore, dependent upon import for the whole of her oil production; but the continent of Europe raised considerable quantities of linseed, rapeseed, poppy, and sunflower. The claim to regard the oilseed trade as one of the key industries of the country was surely established when due regard was given to the huge quantities of oil required by the manufacturers of soap, paint, linoleum, varnish, lubricants, and burning oils among the technical trades; and baking, frying, cooking fat, and margarine manufacturers among the edible trades. The total consumption of oils for these purposes in Great Britain was estimated at 600,000 tons per annum.

As the world's requirements in oils and fats grew every day, the story of past development had been the loss to the technical manufacturer of one after another of his markets for cheap oils, in proportion as scientific achievement had enabled each in turn to be rendered suitable for the edible trades; so a substitute had always to be found to replace for the soap pan the oil now used for margarine. A multitude of varieties of less known oilseeds were found in the world in enormous quantity, but they were either in

districts at present inaccessible or else in a condition or form that rendered them almost unserviceable; but there was little doubt that in years to come, with future scientific developments and treatment, these would take their place among the important sources of oil supply.

Dealing with the products, Mr. Pearson said that it was in handling the products of the mills that the most interesting developments had taken place in recent years, more particularly perhaps as regards the oil product, as the great and increasing demand for oils and fats of all descriptions during the last century had been the reason for the large increase not only in quantity but in variety. Indeed, many oils which less than a century ago had but little commercial value had now been brought into extensive use, not only for technical but also for the finest edible purposes. The most important developments had been connected with the edible oil refineries.

OIL-CAKES.

The other product of seed-crushing upon which a few words must be said was the residue or cake so largely used for cattle-feeding. The cakes most ordinarily produced in this country—*i.e.*, linseed cake and cotton-seed cake—were so well known as to need but few remarks. It was, perhaps, not generally recognized that cake as a feeding-stuff was not only a concentrated food, but a cooked food. Its intrinsic value depended largely upon the extent of concentration, which varied entirely with the individual seed used. By far the most popular cake in England was linseed cake, which showed no sign of being routed from its premier position even by the introduction of more modern articles, such as sesame and ground-nut cake. Linseed cake served an all-round purpose which was attained by no other, and might be used either as a fattener or a milk producer. For dairy purposes ground-nut cake and coconut cake had become exceedingly popular, and would become more so as the industry increased in England. The newer production, palm-kernel cake, was still a difficult market. The residue was unpleasant in the mouth, woody and unpalatable to the feel and taste. It was not consumed with relish by either cattle or sheep, and possibly the high proportion of fatty acids in the oil content might have something to do with its slightly unpalatable flavour. As a pig food it had always had an enormous outlet in Germany, and, while its qualities in that direction had been demonstrated over and over again in the last few years, it still remained to be seen whether it would be able to oust barley meal from its position as the pigfeeder's favourite when once the supplies of ordinary feeding-stuffs reached normal levels again. When properly ground there was no doubt as to the feeding value of palm-kernel cake, and great efforts would be made to extend its use in England in order to ensure that this country might be able to retain the palm-kernel crushing trade which had been carried on here during the last four or five years, and which previously was almost an entire monopoly for Germany.

A trade round which much debate had centred had been that of the production of cottonseed cake. The practice in England had differed from that in most other crushing centres of the world. The difference in systems was usually described as the production of decorticated cake or undecorticated cake. The America crusher decorticated the whole of his seed, crushing the kernel alone and producing thereby a cake rich in albuminoids and highly concentrated as a feeding-stuff. The shell, however, was largely wasted or had to be sold at a very low price. The practice in England had been to crush the whole seed at one operation, kernel and shell together. This system produced cake of lower value with a lesser degree of concentration, and consequently a more bulky feeding-stuff. It retained, however, certain astringent properties which were highly valued for use with the soft lush grass of this country as a sheep or cattle food, and when fed to grazing beasts it had no effective substitute. The result had been that relatively higher price was paid here for undecorticated cake than for the decorticated, and consequently the American process had never found favour on this side.

Mr. E. D. Segundo said that cotton-seed might for all practical purposes be divided into two categories—the woolly or upland variety and the bald or Egyptian variety. In the case of the bald variety, the long staple cotton was practically all removed in the ginning process, and went to the textile industry: in the case of the woolly variety there was retained by the cottonseed in ginning an undergrowth of short cotton fibres. Of the 12,000,000 tons of cottonseed produced in the world in an average year, 95 per cent was of the woolly variety. When the woolly fibres were removed they formed a well-known trade commodity called linters, from which was produced explosives, paper, felt hats, and many other things. A recent machine had enabled the defibrating process to be carried a stage further than hitherto, producing a commodity called seed lint, and at this point the woolly seed was reduced to the same condition as the bald variety. So far as the British seed-crusher was concerned, he took the seed in hand at this stage, turned it into oil and cake, and there the process stopped. But the American practice was different. The American decorticated his seed, and, in order to ensure efficient decortification, it was necessary that part of the fibre should be left upon

it. The American split the seed, took out the kernel, and produced three products as against the two of the Englishman. He produced the oil, the hulls—which were the remnants of the seed after the kernel was extracted—and a highly nitrogenous and concentrated food in the shape of the decorticated cake.

COTTONSEED UTILISATION.

A machine, which had only been introduced commercially about two years before the war, separated the hulls into their component parts, hull fibre and shell bran. Linters, seed lint, and hull fibre were all different grades or qualities of the residual fibre left on the woolly cottonseed after ginning, and were all equally available for the production of cellulose, which was the basis of a number of industries, such as the manufacture of absorbent cotton, writing papers, artificial silk, artificial leather, and celluloid. Previously to the introduction of the machines alluded to for the defibrating of the woolly cottonseed, a great deal of the cottonseed produced had been unsuitable for the British seed crusher; hence it might be considered that this kind of cottonseed was now entering upon a new era in its history. Mr. Pearson had pointed out that until comparatively recently the British seed-crusher was concerned mainly with the production of cake, hence his desideratum had been a raw material containing not too large a proportion of oil. On the other hand, manufacturers on the Continent for some years before the war had gone ahead in the manufacture of edible oils, and had therefore sought out the raw materials which gave the highest percentage of oil. The war had changed a good many things, and amongst others it had entirely revolutionised the ideas of the seed-crusher in this country as regards the primary product of his industry; the richer oil producing seeds had become much more prominent, but they would not force cottonseed into the back ground. Professor Todd had estimated that to meet the world's requirements there must be a cumulative increased production of 800,000 to 1,000,000 bales of cotton per annum, so we might look for a proportionate increase in the production of cottonseed, and 90 per cent of it would be of the woolly variety. Whatever might be said about the richer seeds, cottonseed oil was still unrivalled as a means of producing margarine and other edible oils; so, provided the cottonseed was thoroughly cleaned by the seed-crusher before it was treated further, it would take in the near future a far more important place in tha category of raw materials than it had held in the past.

Mr. Chadwick the Indian Trade Commissioner, said that in our tropical possessions we had a very large area of land suitable for the production of ground-nuts, copra, and rich bearing oilseeds. Taking the Empire as a whole, we produce more of the richer oilseeds than of the poorer ones. The fact that crushers in this country had not wanted the richer oil seeds had led India to seek a market for them in Continental countries. Some authorities considered ground-nut cake to be for feeding purposes in no way inferior to cotton cake.

BOOKS IN BRIEF.

India in the years 1917-18.—*By L. F. Rushbrook Williams, Fellow of All Souls. Superintendent, Government Printing, India, Calcutta. Price Re. 1. or 1sh. 6d.*

This is the first time that a Report of this kind has been drawn up by a scholar of the type of Professor Rushbrook Williams. The period covered by the Report has been one of more than ordinary interest. Professor Williams has described the history of the progress of the country during this period with great skill and considerable leterary acumen. The narrative is divided into certain main heads, which may be referred to here to show the range covered by it:—India and the War; the Political Record; The Economic Background; Some Lines of Advance: Moral and Material, and Some Governmental Activities. It will be seen that Professor Williams has had to deal with controvertial matters of a kind as well. On these he writes with ease, though opinions will naturally differ as to his deductious. As a resume of current history the book is worth reading.

The Silk Industry and Trade.—*By R. C. Rawley, M.A., M.Sc. (Econ). Carnegie Research Fellow. Published by P. S. King & Son. L. W. Westminister.*

We have reviewed in this *Journal* at length Mr. Rawleys larger book on this subject. This book covers much the same ground, being a study in the Economic organization of the export trade of Kashmir and Indian silks, with special reference to their utilization in the British and French markets. Mysore is silk producing country and its interest in the topics dealt with by Mr. Rawley in this book is manifestly great. We think there is point in Rawley's operation that an inquiry conducted on practical lines in Japan and America would be of great value to our silk industry. We commend the volume to all interested in Sericulture in the State.

The Future Government of India.—*By Mr. Ernest Barker, M. A., Fellow and Tutor of New College, Oxford. Messrs. Methuen & Co. Ltd., London. 1sh. 6d. net.*

This book is made up primarily of papers and letters on the Montagu-Chelmsford Scheme of Indian Reforms. Mr. Barker's exposition of the future Government of India is based on the report; while the letters included in the book are from a Civilian from India on the same subject. The criticism contained in the letters is shrewd and the value attached to it by Mr. Barker is fully justified. The scheme included in the report is now an Act of Parliament. In working it and making it success both the

people of this country and the Civil Service will have necessarily to heartily co-operate. After reading the Civilian's letters in this little volume, no one will say that his brethern in the service will stand in the way of constitutional development in India. We say this despite the strong criticism put forward in this book about the Government failing to consult service views in this matter (see p. 22). The Civilian writer resents the inference that the members of this service are "so small minded as to think only of our own interests when we should be building a constitution."

Essays on Indian Economic Problems—*By Brij Narayan, M. A., Professor of Economics, Sanatana Dharma College, Lahore.—The Panjabee Press, Lahore. Price Rs. 2-5-0.*

This is a reprint in part of articles on Economic topics contributed by the author to various Indian periodicals. The war bulks large in the volume. That is justifiable because of its effects on the finance, commerce, and the general well-being of the country. Professor Brij Narain elucidates the various topics he touches on by a wealth of carefully chosen facts and figures. There are some useful charts to illustrate the points urged. We have noticed a few printers' errors, which we have no doubt will be rectified when a new edition is called for. The book ought to prove useful to both students and lay readers.

Eastern Exchange, Currency and Finance—*By W. F. Spalding, Fellow of the Royal Economic Society (2nd Ed.) Sir Issac Pitman & Sons, Ltd., Amen Carnor, London, E.C. 4.*

That a second edition of Mr. Spalding's book should have been called for within a year of the first shows how well it fills a desideratum. Mr. Spalding deals specially with the Economics of Eastern banking. He brings out in a strickingly telling manner the somewhat intricate subject of Eastern exchange. He shows more clearly than any writer we are aware of the process by which the financing of imports and exports by means of bills f exchange and similar credit instruments is managed. Mr. Spalding's practical experience has enabled him to produce a book which ought to be useful to both the general and the commercial public. We would like to see the book receive attention at the hands of the Boards of Studies in Economies and Commerce of the various Indian Universities. A book like this, thoroughly practical and informing, and yet written within limits, ought not to escape their notice.

Miscellaneous.

We have received from Messrs. W. T. Bush & Co. Ltd., London, a copy of the *Perfumery and Essential Oil Record Year Book and Dairy for 1920.* As usual it is neatly and carefully got up, the literary contents being up-to-date and accurate. The perfumery trade in India is a daily growing one and no one interested in it ought to be without a copy of this year book.

The C.L.S. for India, Madras, has sent us a copy of Rev. Mr. Bogg's *Useful Information for Missionaries.* (Price as. 12) It contains a variety of useful information which ought to be helpful to missionaries and others who have to turn their hand to many different things in out of the way places.

Messrs. Ganesh & Co., Madras, have sent us a copy of Sir John Woodroffe's *Is India Civilized* (Price Rs. 2-8-0). In this the learned author states the main principles of Indian civilization. Though controvertial in one sense, it is full of shrewd reasoning. Messrs. Ganesh & Co., have also sent us copies of the following:—Mr. J. H. Cousins' *Moulted Feathers*, which has enshrined in it some excellent verse and *Footsteps of Freedom* which is a topical study which ought to appeal to many people in India; Mr. Ghandi's *Indian Home Rule* in which the author shows how the law of love is the law of life; and Mr. S. Satyamurti's *Rights of Citizens*, which is a plea for the abrogation of laws restricting the liberty of the subjects in India.

ACKNOWLEDGMENTS.

Report of the Madras Salaries Committee—*Superintendent, Government Press, Madras.*

Year Book of the Madras Agricultural Department for 1919.—*Superintendent, Government Press. Price 12 annas.*

Proceedings of the Third Annual Conference of the Indian Economic Association.—*S. P. C. K. Press, Vepery, Madras. Price Rs. 2. [Copies to be had of Hon. Treasurer, Madras Section of the Indian Economic Association, Victoria Buildings, Commander-in-chief's Road, Egmore, Madras.]*

Administration Report on Railways in India for 1918—19. *Volume I Report and Volume II Appendices. Government Central Press, Simla. Price, Vol. I Rs. 1-8-0; Vol. II Rs. 2-4-0.*

The Commercial Museum and Commercial Library, *being Supplement to the "Indian Trade Journal," April 23, 1920. Published by the Commercial Intelligence Department, 1, Council House Street, Calcutta. Printed by the Superintendent, Government Printing, India. To be had gratis.*

The Villager's Calendar for 1920-21.—*Published by the Agricultural Department, Madras. It is repleto with technical statistical information, of inestimable value to the agriculturist. pp. 91. Price 1 anna.*